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STUDIES IN

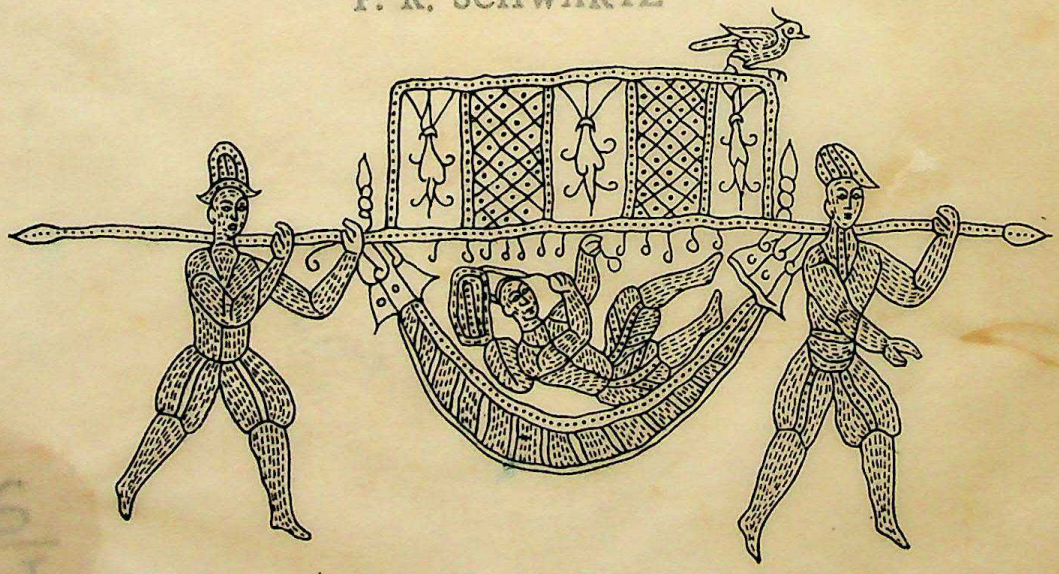
INDO-EUROPEAN TEXTILE HISTORY

by

JOHN IRWIN

AND

P. R. SCHWARTZ



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Calico Museum of Textiles Ahmedabad India

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Fig. 1: Detail of a hanging: cotton, embroidered with silk in chain-stitch.
Made for European market; Gujarat, about 1680.
Calico Museum of Textiles

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Preface

THE essays published here under a single title first appeared in the Journal of Indian Textile History, where they were published in serial form. We founded that journal in 1955 in the belief that a textile museum should not only have the static function of preserving historic fabrics but also give a lead as a centre of research and expertise. In our first editorial we advanced the hope that the journal would provide a focus, and at the same time set a standard, for all those wishing to see Indian textile history seriously studied.

The journal has been so appreciatively received by textile historians and by the relevant libraries and museums in all parts of the world that the early issues are now scarce and difficult to obtain. This book is therefore published with the aim of giving some of the most important contributions to the journal a permanent form.

We are grateful to Mr. John Irwin and Monsieur P. R. Schwartz, the two authors concerned, for kindly consenting to republication and for the trouble they have taken in bringing their material up to date. We are also grateful to Miss Margaret Hall for revising the maps and giving much valuable help in proof-correcting.

Mr. John Irwin has been closely associated with the Journal of Indian Textile History since its inception and is Keeper of the Indian Section, Victoria and Albert Museum. Monsieur P. R. Schwartz, an eminent authority on the history of dye-chemistry, is Vice-President of the Société Industrielle de Mulhouse, and administrator and secretary of the same society's Musée de l'Impression sur Étoffes (Museum of Printed Fabrics), founded at Mulhouse, France, in 1858, and the leading institution of its kind in Europe.

Calico Museum of Textiles
Ahmedabad.
January, 1966.

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Authors' Addendum

When this book was already in the press and proofs had been corrected, a discovery of great importance was made in the archives of the Bibliothèque nationale, Paris, in the form of a manuscript-volume of 333 pages, written between 1678 and 1680, and henceforth to be known as the Roques Ms. (F. Fr. 14614). Roques was an agent of the Compagnie des Indes employed in Western India, and the document consists of a detailed account of the textile trade and manufacturing processes witnessed by the author mainly at Ahmedabad, Burhanpur and Sironj, addressed to the company's chief agent at Surat.

The Roques Ms. is now under study, and its full significance remains to be assessed. It is hoped in due course to publish the whole or part of it in translation in the Journal of Indian Textile History. One important feature should, however, be mentioned here by way of an addendum. In final rejection of the uncertainty expressed on pp. 119-120 of this book, it can now be said that Indian craftsmen *did* practise woodblock printing, and that they thickened their mordants (iron for black, aluminium for red) and pigment-colours (e.g. ochre) with a tree-gum. The results, says Roques, were often poor, but he does not explain whether defects were due to bad printing or bad colours. As explained in our text (p. 122), thickened alum could not be expected to give such good results as unthickened alum applied by brush. To overcome this problem, European manufacturers looked for another mordant and eventually discovered the best of all—that is, aluminium-acetate. It must further be emphasized that the quality of colour depended on the nature of the dye-plant itself. Roques explains that the cotton-printers whose operations he witnessed used not chay-root (for which the Coromandel coast was famous) but the root of " saranguy ", probably a corruption of " vartanguy " or Sappan-wood, which gives an inferior red.

J.C.I. and P.R.S.
May, 1966.

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CHAPTER I

Western India

TEXTILES were the foundation of Indo-European commerce. Yet little attempt has been made so far to investigate this aspect of the trade in detail. What was the exact description of the fabrics for which India was famous at this period? Why were they so strenuously sought by foreigners all over the world? Where were the chief centres of manufacture? What were the methods of trading and the relations of production? This study is an attempt to answer such questions, mainly on the evidence of trade records surviving in English archives.

One fact soon discovered is that during the two thousand years intervening between the Roman period and the decline of the handloom industry in recent times, there had been no significant change in the main areas of Indian textile manufacture. They are described in the *Periplus*[1] of the first century A.D. in much the same terms as they were described by travellers of the seventeenth and eighteenth centuries. These main areas were three: *Western India*, with Gujarat, Sind and Rajputana as the focus; *South India*, comprising the Coromandel Coast as it used to be known, stretching from the Kistna Delta to Point Calimere, and *North-east India*, including Bengal, Orissa and the Ganges valley.

The main reason for this disposition of the industry was of course geographical. Each of the three areas could offer ports suitable for foreign shipping, and also comparative ease of inland communication. The latter, facilitating administration resulted in greater political stability than was usual in most other parts of India.

The history of Indian textiles can be conveniently divided into the history of these three main areas, each of which specialised in certain classes of fabrics, developed its own techniques (characterized by its own decorative idiom), while at the same time sharing a general likeness which might justly be called Indian.

COMMERCIAL POLICY

As it is English records which have provided the main source of information for this paper, it is perhaps necessary to begin with a brief account of the commercial policy which governed the English East India Company's purchases of Indian textiles during the seventeenth century. This may be summarised by the four distinct purposes for which Indian textiles were needed, and which are fundamental for an understanding of the trade:

1. Barter for pepper and spices in the Malay Archipelago.
2. Shipment to London for *re-export* to North Africa, Turkey and the Levant.

[1] *Periplus of the Erythraen Sea*, trans. by W. H. Schoff, Philadelphia, 1912.

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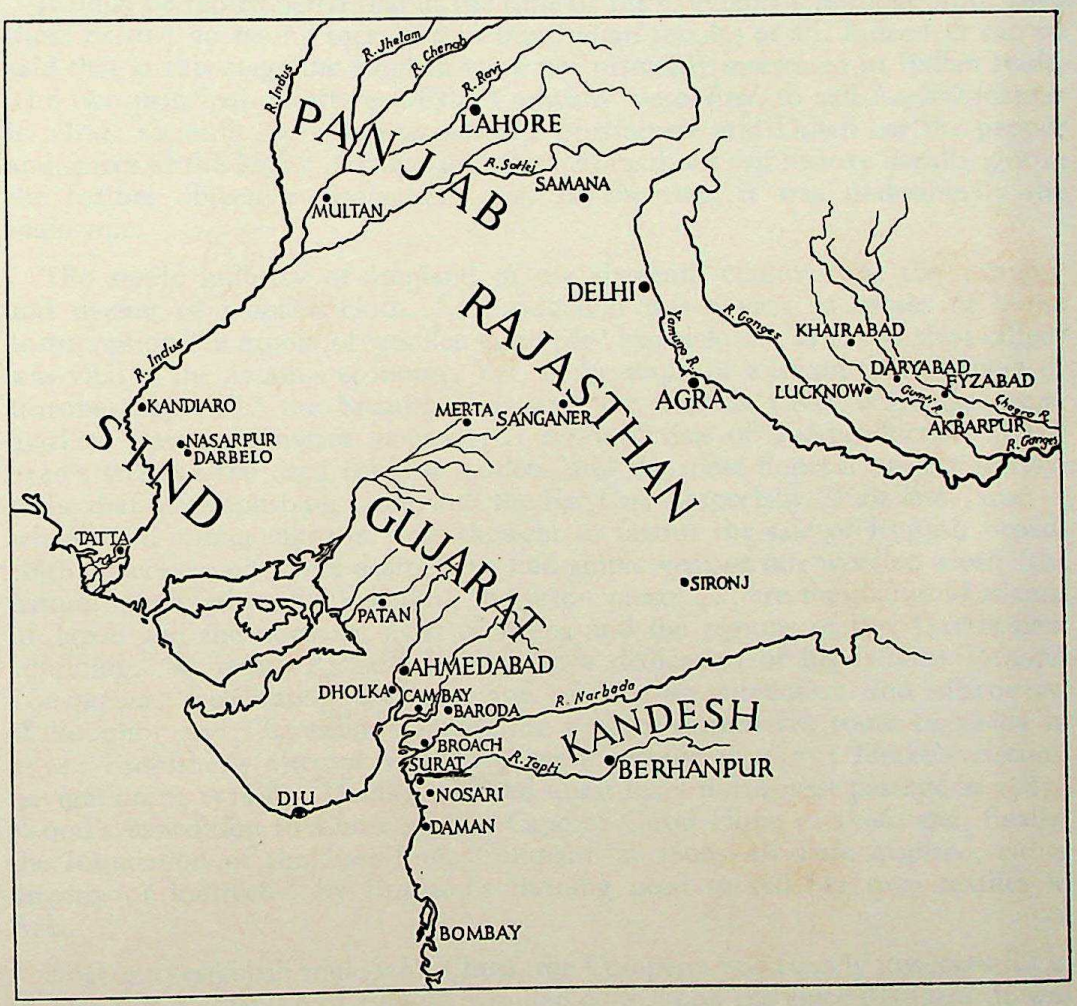

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3. Shipment to London for the home market.

4. Shipment to London for *re-export* again to West Africa and the slave plantations of the West Indies.

Selection of textiles in India by the Company's factors there resident closely depended upon which of the four different destinations was intended. Very few of the fabrics would have been equally suitable for all of them.

It must be remembered that at the time of the Company's foundation in 1600 there existed no strong incentive to buy Indian textiles at all. Indeed, it can be said that at this stage the English were not primarily interested in Indian trade. The two principal objectives of the Company were, first, to sell *English* textiles in *Asia*; secondly, to compete with the Portuguese and Dutch for the pepper and spices of the Malay Archipelago. Popular textbooks of history usually ignore the former objective altogether; yet, of the two, it was undoubtedly the main one.

The staple industry of England in the sixteenth century was the weaving and dyeing of woollen cloth. As production was always in excess of home consumption the export of woollen cloth (or 'broadcloth', as it was then called) was vital to the national economy. Yet, as the result of wars on the continent of Europe—especially the Spanish War and the French Civil War—the usual markets were in constant jeopardy. A serious crisis of overproduction in the 1550's stressed the need for new outlets, and the most hopeful project seemed to be that of establishing trade with the Far East—especially China and Japan—where cold winter climates were thought to favour the sale of English broadcloth. 'Because our chief desire is to find ample vent of our woollen cloth (the natural commodity of this realm), the fittest places . . . are the manifold islands of Japan and the northern parts of China and the regions of the Tartars next adjoining.' So wrote Richard Hakluyt in a dedication of his famous *Principle Navigations*,[1] celebrating the new age of English adventure and discovery. Willoughby and Chancellor's search for a north-eastern sea route to China in 1554; Frobisher's attempt at a north-west passage in 1575; Drake's circumnavigation in 1578-83; Davis's renewed quest for a north-west passage in 1585; Wood's expedition to China via the Cape of Good Hope in 1596, and, finally, the foundation of the East India Company in 1600—all were inspired, either directly or indirectly, by England's burning need to sell her own textiles in Asia.

Unable to establish trade with China, the Company was equally unsuccessful in its attempts to dispose of English woollen cloth upon the spice-islanders. It was soon discovered that the only commodity acceptable there was *Indian* textiles, and this prompted the Company to seek a market for its woollen goods in India with the idea of buying in return the Indian cottons and silks wanted in the spice islands.

First ship

With this in view, the first English ships reached Surat in 1608. It was a time when the Mughal court and nobility were willing to buy any novelty from

1 Dedication of vol. 2, 2nd edn., London, 1599.

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Europe, and English broadcloth, surprisingly enough, was no exception. In fact, ' they all strived who should have the most '[1], so keen were they to try it out. But success was short-lived, for, as the Company's factors shrewdly observed : ' the country about aboundeth with coarse cotton cloth made there, better colours and cheaper by far than in England ; so that ours is used more for novelty than for want.'[2] Three years later they reported to the London Directors : ' Concerning cloth, which is the main staple commodity of our land . . . it is so little regarded by the people of this country that they use it but seldom. Only the King [i.e. Jahangir] doth help us a little, because he taketh some years about a hundred pieces ; who converteth it to these uses : he maketh with the same covertures for certain pretty castles that are wont to be fastened upon the backs of his elephants, wherein his women ride when he goeth abroad for solace sake some few miles from his seat of residence ; certain carts, wherein his women ride, are covered with the same ; and a kind of little litter carried upon men's shoulders, that are in the Indian tongue called palankees, wherein their women are likewise carried ; again they sometimes make saddles therewith . . . '[3] In spite of most determined efforts to push sales, the factors again and again reported failure. A decade later the Company had finally abandoned hope of a big Asian market for English broadcloth.

Failing broadcloth, what English commodity could be sold in India in return for the Indian textiles required as barter for pepper and spices in the Malay Archipelago ? The Company tried many alternatives. They included bulk consignments of looking-glasses, sword-blades, oil-paintings, drinking glasses, quicksilver, coral and lead.[4] But to little avail. In the end the factors were forced to conclude that ' no commodity brought out is staple enough to provide [in return] cargo for one ship '.[5]

As a result the Company had to fall back on the export of bullion (especially in the form of gold) for the purchase of goods wanted from India. This change was a significant one having important repercussions. It gave new zest to the Company's enemies at home, who claimed that the export of bullion was draining

1 Letter from Surat factors dated 14th August, 1614. *Letters received by the E.I.C. from its servants in the East*, 1613-15, ed. by W. Foster, London, 1897, p. 97.

2 Letter from Surat factors dated October, 1615. British Museum, Additional Ms. 9366.

3 Letter from Sir Thomas Roe to Kerridge at Surat, dated 25th April, 1617. *Letters received by the E.I.C.*, 1617, ed. by W. Foster, London, 1902, p. 200.

4 Although not strictly relevant to the subject of this paper, it is tempting to give an illustration of the Company's ingenuous attitude towards the marketing of these commodities. To stimulate the demand for English lead in India, it was decided to send out ' plumbers to teach them the use of pumpes for their gardens and spowtes on their houses '. This was followed by a scheme to persuade Jahangir to pay for the erection of waterworks for the supply of Agra, knowing that it would require plenty of lead piping. There is another story of how the London Directors, hearing that Indians ' are very superstitious and washe their hands whensoever they goe to their worship ', immediately ordered the despatch of a consignment of wash-basins for trial sale. These incidents are recorded in I. O. Archives, Court Book III, p. x.

5 Letter from Sir Thomas Roe, dated 10th September, 1616. I. O. Archives, Marine Records, vol. II, p. 1.

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England's wealth. The Directors' best answer to this challenge was *re-export* trade, whereby Indian goods brought to London were re-exported to the European continent and the Levant, thus securing the return of the original wealth, plus trading profit. *It was in this connection that Indian textiles first began to play an important part in the Company's commercial policy at home.*

For centuries prior to this, Indian cotton goods had reached North Africa, Turkey and the Levant via the Red Sea or the Persian Gulf, and then overland by caravan, paying enormous tolls on the way. Now the same goods, carried all the way by sea, could compete with the old trade on favourable terms. The East India Company did not itself send ships into the Mediterranean : this was done by the independent Levant Company, to whom the goods were sold in London ; and, as many of the East India Company's factors resident in India had formerly served with the Levant Company, they knew exactly what cotton goods to order for the Mediterranean markets.

The English Company's early purchases of textiles in India were largely dominated by the requirements of this re-export trade. The chief item was fine muslin, which was much in demand in Turkey and North Africa, especially in the form of turban-cloth and girdles. Turban-cloths were commonly called by the factors ' Barbary shashes '—Barbary being a contemporary name for North Africa, and ' shashes ' being derived from Arabic *shāsh*, muslin.

Until the 1620's, there was no regular demand for cotton piece-goods on the English home market. Such interest in Indian textiles as existed prior to this was limited to luxury articles, such as painted or embroidered quilts and hangings which were esteemed primarily for their curiosity value. The uses to which *plain* calicoes might have been applied were then fulfilled by linens imported from France, the Netherlands and Germany, which were sold under such names as hollands, lawns (after Laon), cambrics (after Cambrai), and silesias (after Silesia). Only gradually did the English awaken to the advantages of cotton as an inexpensive substitute for linen. When the Company's factors became aware of the possibilities of this trade, they began applying the terminology of the European linen trade to India. Thus, calicoes comparable with Belgian linen were called ' calico lawns ' ; another grade was commonly referred to as ' hollands '.

The earliest indication of Indian cotton goods being popular in England was in 1623 when King James I, in conversation with two Directors of the Company asked them ' what vent they had for the great masse of callicoes [that] come yerelye'; whereupon they replied that ' much of it is very useful and vendes in England, whereby the prices of lawnes, cambrickes, and other linen cloth are brought down . . . '[1] As it happens, the calicoes of Western India were never considered such suitable substitutes for linens as the famous Longcloth of the Coromandel Coast, which will be discussed in the next article. Nevertheless, the sales of even Western Indian calicoes were increasing rapidly until Gujarat was struck by the terrible famine of 1630. The Surat factors' letters of 1630-2 contain

1 I. O. Archives, Court Book VI, minutes dated 6th August, 1623.

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many vivid accounts of the desolation wrought by this drought-inflicted famine, which resulted in ' the poore mechaniques, weavers, washers, dyers, etc., abandoning their habitacions in multitudes, and instead of relief elcewhere they have perished in the fields for want of food to sustaine them.'[1] A year later, conditions were described as little changed : ' This that was in a manner the garden of the world is nowe turned into a wilderness, having few or no men left to manure their ground nor to labour in any profession ; so that places here that have yielded 15 bales of cloth made there in a day hardly yields now three in a month . . . '[2]

It was many years before the Gujarat textile industry returned to normal, and in the meantime much harm was done to its prestige by an inevitable decline of standards and increase of prices. One result was that the Company was forced to develop alternative sources of supply. This included the opening of trade with Sind in 1635, and a large increase in the purchases of cloth made in the Agra area—especially at Lucknow, Daryabad and Fyzabad in U.P., and Samana in Patiala. At the same time, samples of many of the Gujarat piece-goods were sent to the Coromandel Coast for imitation by South Indian weavers.[3]

The next important development in English textile trade with India was the sudden growth in demand in the 1630's for cheap calicoes for African negro markets. These goods were wanted not only for barter with negroes on the West African Coast but also for sale to plantation-owners in the West Indies as cheap clothing for their slaves. This was a four-cornered trade, closely bound up with the vast slave trade conducted from England. First, the Indian calicoes were brought to London by the East India Company and there sold to merchants trading under the name of the Royal Africa Company. The latter's ships sailed to West Africa loaded with these calicoes which were there bartered for slaves, to be sold in the West Indies. On reaching the West Indies, the merchants sold whatever was left of the Indian cloths to plantation-owners, and subsequently bought produce, such as sugar and tobacco, for the return journey to England.

The generic term for Indian calicoes used in this trade was ' guinea-cloth ', or ' guinea-stuff ', named after the Guinea Coast of equatorial West Africa, from which most of the slaves came. They were mostly striped or chequered cloths, much admired on account of the brightness of their colours and the fact that the dyes were non-fugitive. Although the East India Company was not directly concerned with the slave trade, they were nevertheless careful to study the needs of this market, which contributed much to their prosperity.

From 1660 onwards, the demand for Indian calicoes and silks for all purposes—and especially for the English home market—increased enormously. ' As ill

1 *The English factories in India*, 1630-33, ed. by W. Foster, Oxford, 1910, p. 122.

2 *Ibid*, p. 178.

3 In 1645, the Madras factors wrote that they had experimented with the imitation of all Gujarat cloth with the exception of ' silk patolas ' and ' tapichindas '. They added that they had no doubt about the ultimate success of this policy, provided they could get from Surat ' a skilful workman for their well making up and the glazing of their heads . . . For the price of the cloth we believe that they will be something cheaper than at Surat.' I. O. Archives, Official Correspondence, No. 1952.

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weeds grow apace,' declared the English politician Pollexfen of the trade in 1681, 'so these manufactured goods from India met with such a kind reception that from the greatest gallants to the meanest Cook Maids, nothing was thought so fit to adorn their persons as the Fabrick from India!'[1] The years 1670-1700 were the boom period of the seventeenth century, suddenly terminated by the notorious act of 1701, which imposed serious limitations on the import of Indian fabrics into England. The foundation of the Company in 1600, and the legislation of 1701, provide natural limits for the present study.

TRADING METHODS IN INDIA

When the English Company began trading in India, it was usual for the merchant in charge of a ship[2] to be given a 'commission', which included clear instructions as to the cargo he should purchase for the return journey. This practice was soon found to have serious commercial disadvantages. Above all, it meant that the very appearance of an English ship at an Indian port was enough to force up local prices. Moreover, ships could not be kept waiting indefinitely, with the result that there was little time for bargaining or the commissioning of articles to order. With the Portuguese this problem had not arisen, as they had their own territorial settlements to serve as entrepots. Their big ocean-going ships did not ply the coastal trade at all. With the Dutch and English latecomers, on the other hand, the position was different, and to overcome the difficulties described they were obliged to inaugurate the 'factory' system.

Factories in this sense were not of course places of manufacture[3] but simply the fixed headquarters of the Company's resident agents, or 'factors' as they were called. Thus, residents of a factory were responsible for the buying and storing of all goods required for export. At one time or another, the English Company maintained its own Factories (each consisting of two or more resident factors) at Surat, Broach, Ahmedabad, Cambay, Agra, Tatta, Lahore, Sironj, Burhanpur and Ajmer.

Surat was of course the Company's principal factory in Western India until the last quarter of the seventeenth century, when seniority passed to Bombay. Prior to this, the President of the Council at Surat was ultimately responsible for trading operations throughout the whole area.

For the actual buying and commissioning of goods, the factors normally depended upon brokers, both Hindu and Muhammedan. Sometimes the brokers were independent merchants engaged on a percentage commission, but on other occasions they were salaried employees of the Factory. Where dependable brokers of independent standing were available, the former arrangement seems

1 From a speech before the Board of Trade. India Office Library Tracts, vol. 83, p. 50.

2 Although the senior merchant was known as Captain, it did not follow that he was qualified in seamanship. Navigational control was in quite separate hands.

3 There was the occasional exception when the factors, in face of trading difficulties, were obliged to employ craftsmen at the Factory for some special purpose, such as the dyeing of goods which they couldn't procure in time elsewhere, or the stuffing of quilts and pillows which would otherwise have added to transport costs.

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to have been usually adopted. However, no brokers were ever loved by the factors, and more often than not even the best of them were cursed for their duplicity towards both the Company and the weavers. Nevertheless, the Company were forced to deal through them, partly on account of their knowledge and experience of local conditions, and partly because of the weavers' fear of victimization if they dealt direct with the Factory. The inland brokers were on the whole worse than those of Gujarat, and the following is a typical complaint made by the Agra factors in 1645 : 'These people [brokers] here we find them so extraordinarily full of deceipt as cannot by any means urge us to put confidence in any of them. Imployment for two or three honest able brokers from Surat would be here both advantageous to themselves and useful unto our masters . . . But how to better ourselves we know not ; fearing, if we should discard these now in our imployment, to have worse in their rooms. It may very well be answered those brokers in Surat are as crafty knaves and have as nimble a faculty in deceipt as those here . . . but when hither transplanted, the soil will not prove so fertile to their fraudulent humours, when and where they will be so odious to these people as not any of their actions possible to be obscured from our knowledge.'[1]

After allowing for the one-sidedness inevitable in the English factors' observations, it is difficult to escape the conclusion that the broker-system was a primary cause of the weavers' extreme poverty. From any other point of view, it is difficult to reconcile the weavers' poverty with the fact so often apparent that the Company was buying in a sellers' market. Indian fabrics—especially calicoes—were wanted all over Asia in quantities far exceeding supply, with the result that competition among buyers was always acute. Yet, such was the power of the brokers that they were apparently able to dictate prices to both the weavers and the Company and often to deceive both in the process.

Instances are frequent of the factors being unable to secure improvements of weaving standards on account of the willingness with which other purchasers would buy the rejected cloth. Sometimes it was difficult to secure even a consistent standard of weaving, for a common ruse among the weavers was, instead of putting up the price of their cloth, to reduce the number of wefts to the inch and thus save on material. From time to time the factors protested against this practice, but without avail, because 'the close striking of the threads would make the cloth shorter or use more yarn to accomplish its accustomed length, which being prejuduciall to the poore workmen they will not be persuaded thereto ; for if your broker refuse, *others do buy as fast as they are made*.'[2]

Similar difficulties were experienced—and for the same reason—with dyers, for many of the cotton piecegoods exported by the Company had to be bought

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[1] *The English factories in India*, 1642-45, ed. by W. Foster, Oxford, 1913, p. 300. Seven years later the Agra brokers reported that they had on their staff five salaried brokers : Ananti Das and Bindaban (at Rs. 20 per month), Gokul (Rs. 10), Chhajja (Rs. 10), and Madu (Rs. 10). See the volume for 1651-4, p. 112.

[2] Letter from Surat factors dated 4th January, 1628. I. O. Archives, Official Correspondence, no. 1264.

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as white cloth and dyed separately to order. The Ahmedabad factors, in particular, were often troubled by ' the dyers dishonest dealing with us ; who in this type of multiplicity of business, send in our goods cured in such evill manner as that we cannot receive them without assurance of after complaints against us ; and when we return them to be perfected, we send them to lye by the walles, since with others (they say) such ill dyed goods will find acceptance, and such men must then be first served.'[1]

PAINTED AND PRINTED CALICOES

Painted and printed calicoes constituted the most important class of Indian fabric exported from Surat in the seventeenth century. They covered a wide range of quality, the best and more expensive being *painted* rather than *printed*. To the textile historian, the distinction is an important one. In the former case, dyes and mordants were applied to the cloth, not with a wood-block, but free-hand with brush. Thus, each painted design had the character of individual drawing with the human and sensuous touch, instead of being limited to the repeat-pattern imposed by the print-block. Sometimes painting and printing techniques were combined, but the finest decorative calicoes from both Western India and the Coromandel Coast were of the *painted* kind.

In early European trade records both painted and printed calicoes were called either 'chintes' (from vernacular *chitta*, 'spotted cloth') or 'pintadoes' (from Portuguese *pinta*, 'a spot, fleck', which also gave Portuguese *pintada*,' Guinea-fowl').

The chief centres of cotton *painting* in Western India were Sironj in Rajputana, and Burhanpur in Khandesh. The latter came first to the notice of the Company, and in 1609 the factors wrote from Surat: ' Pintadoes of all sorts, especially the finest, should yield good profit, I mean such as are for quilts and fine hangings, they are here to be had in very great abundance being brought from a place called Brampore [Burhanpur] some eight days journey of this place.'[2] In spite of being enveloped by Aurangzeb's civil war, Burhanpur retained its importance as a centre for cotton paintings until the end of the century.[3]

Sironj, which also retained its importance in this respect throughout the seventeenth century, was first mentioned in 1611. ' This cittye [Sironj] is greate, and lyeth at the foote of a high mountayne, with a castell at the top. It stands in very fertile soil, and doth yield very rich pintados of divers sorts.'[4] In 1630,

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1 Letter from Ahmedabad factors dated 2nd February, 1647. *The English factories in India*, 1646-50, ed. by W. Foster, Oxford, 1914, p. 99. When similar difficulties were experienced at Broach in the same year, the factors equipped their own ' Dyeing house ' with 36 vats, close to the Factory compound. I. O. Archives, Factory Records Surat, vol. 102A, p. 121.

2 *Letters received from the E.I.C.*, 1602-13, ed. by F. C. Danvers, London, 1896, p. 29. Ralph Fitch, the first Englishman in India, had commented upon Burhanpur cotton paintings as early as 1584 (*Early travels in India*, ed. by W. Foster, Oxford, 1921, p. 16).

3 It was from this area that the Company obtained the comparatively cheap ' Khaddy chints or 'Caddy chints' so often mentioned in the records. The name probably derives from Hnidi *khadi*, a term still applied to coarse cotton cloth.

4 *Journal of John Jourdain*, Hak. Soc., London, 1905, p. 151.

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Peter Munday described the best Sironj cotton paintings as 'next in goodness to those of Masulipatam.'[1] A similar comment was made by the Frenchman Thévenot, who visited Sironj in 1666.[2]

Agra is also mentioned in the records as an important centre for buying good quality 'pintadoes'; but there is no indication that they were actually made there. In fact, the evidence is to the contrary.[3]

The cheaper *printed* cottons came mostly from Ahmedabad, but those centres already mentioned for their fine painted cottons also produced cheap printed material. Sanganer, although sometimes mentioned as a source of plain woven goods and a good centre for ordinary dyeing operations, was not apparently the famous centre for cotton printing that it is to-day.

During the first half of the century, the demand on the English home market was less for cheap printed cloth than for the fine painted material, which was used mainly for wall-hangings, bed-furnishings and table-covers. In 1631, a set of such hangings 'for fitting a gallery or roome' was about £30.[4] By the middle of the century the average prices must have dropped, for in 1650 we find '*two* setts of pintadoe hangings' fetching only £17,[5] while 'long pintado quilts' were selling at £2-10 each.[6] At the latter price the Directors were forced to admit that 'they serve more to content and pleasure our friends than for any profit that ariseth in sales, your first cost, freight and custom being all put together. Some indication of the prices paid in India for such goods is obtained when it is remembered that the Company held it necessary to realise at least three times the prime cost if they were to be considered profitable.

During the first half of the century, quilts and hangings were usually bought ready-made. As the indigenous patrons of such goods at this time were the Mughal and Deccani Courts, the decorative style was predominantly Indo-Persian, particularly influenced by Safavi brocades depicting scenes with human figures. The English diarist Evelyn was undoubtedly describing an Indo-Persian design of this kind when he remarked upon the Pintado hangings at Lady Maudant's house being 'full of figures great and small, prettily representing sundry trades and occupations of the Indians, with their habits.'[7]

It was not until the 1640's that the London Directors first asked the factors in India to modify patterns according to English taste. 'Those [quilts] which

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1 *Travels of Peter Munday in Asia*, 1628-34, Hak. Soc., London, vol. 35, 1914, p. 56.

2 J. de Thévenot, *Travels*, part 3, ch. 21.

3 '. . . in this place [Agra] is little fine cloth made, and all which is sold here is brought from far.' *Letters received by the E.I.C.*, 1617, ed. by W. Foster, London, 1902, p. 250. See also Pelsaert's *Remonstrantie* (translated as *Jahangir's India*) London, 1925, p. 6.

4 I. O. Archives, Court Book XII, p. 302.

5 *Ibid*, vol. XXIII, p. 69.

6 I. O. Archives, Factory Records Miscellaneous, vol. 12, f. 99.

7 Evelyn's *Diary*, 30th August, 1665. It so happens that all surviving painted hangings of the *early* seventeenth century are of Coromandel origin. These will be discussed in the second article.

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hereafter you shall send we desire may be with more white ground, and the flowers and branch to be in colours in the middle of the quilt as the painter pleases, whereas now most part of your quilts come with sad red grounds which are not so well accepted here, and therefore let them be equally sorted to please all buyers.'[1] These particular quilts were ordered from Ahmedabad; but in 1647 the Surat factors replied that their attempts to secure the required changes had failed. Instead, such goods would in future be ordered from Burhanpur, 'where the painters are said to be better artists'.[2] Here results were more successful. During the next decade orders increased, and the Directors were encouraged to go even further by sending out sample-patterns, prepared in England, for Indian painters to copy or adapt.[3]

After 1662, the sending out of English sample-patterns became the general practice, and it was only on comparatively rare occasions that there were orders for Indian calicoes decorated ' in the country fashion.' Orders increased year by year, and in 1683 the London Directors wrote to the Surat factors: ' You did exceedingly well in observing our direction about Chints as you could then. Now we hope you have more patterns, and our further instructions concerning them which if you pursue and sometimes alter part of their works and grounds with as much variety in colours as of late years you have used to do in Atlasses *you cannot imagine what a vast number of them would sell here to content, they being the ware of Gentlewomen in Holland, but of the meaner sort here*,[4] for which reason a great part of them must be painted upon better cloth than formerly they have used to do. We give you this early hint that you may make great provision of them beforehand. 200,000 *of all sorts in a year will not be too much for this Markett*, if our directions be punctually observed in the providing of them.'[5]

It is worth mentioning that the ' pintado quilt', which had featured so often in trade prior to the 1680's and was a true quilt (stuffed with cotton waste), was now going out of demand, being replaced by the single-sheet ' palampore.'[6]

To give some idea of the magnitude of the Indo-European chintz trade during the last quarter of the seventeenth century, when it was at its peak, we shall

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1 Letter from London Directors to Surat factors dated 27th November, 1643. I. O. Archives, Factory Records Misc., vol. 12, p. 99.

2 *The English factories in India*, 1646-50, ed. by W. Foster, Oxford, 1914, p. 79.

3 I have discussed the role of these sample-patterns in much greater detail in my article *The origins of the ' Oriental Style ' in English decorative art*, Burlington Magazine, London, vol. 96, April, 1955.

4 The fact that prior to the 1680's, Indian chintz was worn only by the menial classes in England was often the subject of satire. Wrote Daniel Defoe : ' . . . such is the power of a mode as we saw our persons of quality dressed in Indian carpets, which but a few years before their chambermaids would have thought too ordinary for them . . . ' (Weekly Review, 31st January, 1708). The earliest mention of fashionable women in England adopting the chintz fashion for dresses appears in the Company's records of 1687 : ' Chints . . . being become the wear of ladies of the greatest quality which they wear on the outside of Gowns and Mantuoes . . . ' (I. O. Archives, Letter Book VIII, p. 275).

5 Letter to Surat factors dated 1683. I. O. Archives, Letter Book VII, p. 210.

6 ' . . . being putt quilts out of use by Palempores . . . " I. O. Archives, Letter Book VIII, p. 304. From Hindi and Persian *palang-posh*, ' bed-cover '.

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close this section with a typical list of the Company's orders for one year. These orders were directed to Western India only and are independent of the cotton paintings commissioned simultaneously from the Coromandel Coast. The year taken is 1695-6 :[1]

20,000	Pallampores large
10,000	,, midling
10,000	,, small
2,000	Quilts large, new patterns, $3\frac{1}{4} \times 3$ yds.
2,000	,, midling
5,000	Quilts small
10,000	Chints Culme[2]
20,000	Chints Caddy,[3] as much variety of works and stripes as may be.
10,000	Chints broad, 9×1 yd. of variety of new patterns
20,000	,, narrow
10,000	Serunge [Sironj] Chints, the best and newest works and paintings on good strong cloth, $\frac{1}{2}$ stripes, $\frac{1}{2}$ flowers.
20,000	Chints Paunch Runge[4]
5,000	Chints Surat.

EMBROIDERIES

Gujarat embroideries were known in Europe before the seventeenth century, having been brought home by the Portuguese[5] as well as by overland traders.[6] The finest surviving example of the sixteenth century is still preserved in the English Tudor manor which originally acquired it.[7]

In view of this previous familiarity, it is not surprising that from an early stage in the Company's contacts with India, instructions were given to factors to be on the look-out for ' quilts and carpets of all sorts made about Cambaya and other places.'[8]

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1 I. O. Archives, Letter Book IX, p. 417.

2 Probably from Arabic *qalam*, ' brush, pen ', implying figured chintz.

3 Probably from Hindi *khādi*, a coarse cotton cloth.

4 Probably *panch rangee*, lit. ' five-coloured '.

5 Perhaps the earliest reference in Portuguese records appears in the inventory of King Manuel I's wardrobe, compiled about 1522, in which there is included : ' An Indian robe from Gujarat, of white brocade, embroidered and lined with crimson taffeta and quilted.' A. Braamcamp Friere, *Inventario de guarda-roupa de D. Manuel*, vol. II, Lisbon, 1904, p. 408.

6 It is not unlikely that Gujarat coverlets were among the embroidered ' toilles de Levant ' often appearing in French inventories of the late sixteenth century. See H. Chobaut, *L'industrie des Indiennes á Marseilles avant* 1680, Memoires de l'Institut historique de Provence, tome XVI, 1939, p 83.

7 This piece is discussed and reproduced in my article, *The commercial embroidery of Gujarat in the seventeenth century*, Journal of Indian Society of Oriental Art, Calcutta, vol. 17, 1949 (issued 1952).

8 Quoted from the Company's commission to Downton in 1614. I. O. Archives, Factory Records Miscellaneous, vol. 25, p. 19.

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By 1614, these embroidered quilts and coverlets were appearing in the Company's London auction sales, and the prices they fetched varied from £10 to £30 a piece.[1] Materials, when mentioned, were usually either 'callicoe embroydered with sundrie silks,' or 'satin' similarly embroidered. From other references in the records, it seems probable that the satin used for such coverlets was not a pure silk satin but the mixed cotton-and-silk fabric known to the factors on the spot as 'cuttanee' (see Glossary at the end).

The English market for these expensive luxuries appears to have reached temporary satiety in the 1620's, when instructions were sent to India to stop all further supplies.[2] In 1631, 'quilts of Petania (Patan) imbroydered with silks' were included among the goods henceforth permitted as articles of private trade,[3] and this may be taken as a final confirmation that they were no longer considered profitable.

The embroidered hanging from Gujarat reproduced in colour as Frontispiece has been shown in another paper (see fn. 7, page 16) to date from the 1680's. There are indications that the Dutch, rather than the English, attached most importance to the embroideries of Western India at this period, and it therefore seems likely that they reached England via Holland. In 1662, the Dutchman Gautier Schouten described embroidered coverlets as one of the *principle* commodities exported from India.[4] In English records of the same period, however, they are very rarely mentioned.

By the end of the seventeenth century, Gujarat embroidery exports were apparently in decline. For instance, in 1725 Alexander Hamilton was able to write of it as a thing of the past: 'They [the people of Cambay] embroider the best of any people in India, and perhaps in the world. Their fine quilts were *formerly* carried to Europe. I have seen some worth £40.'[5]

A new development in the Company's trade in the 1690's was the export to Europe of embroideries from Sind and the Punjab. For instance, in 1696, the London Directors ordered the Surat factors to obtain from Sind and Multan 'quilting stitched very fine upon fine white cloth, both white and upon all other colours . . .' and 'calico or silk finely embroidered according to the country fashion'.[6] Also in the records of the same period, there are many references to the export of embroidered piece-goods, listed as 'best imbroydered baftas.'[7]

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1 I. O. Archives, Court Book III, pp. 150-1, 320, 325-6, etc.

2 I. O. Archives, Official Correspondence, no. 1286.

3 Announced by Royal Proclamation: Public Records Office (London), State Papers 45, vol. 10, no. 150.

4 Gautier Schouten, *Voyage*, Amsterdam, 1708, vol. I, p. 407.

5 Alexander Hamilton, *New account of the East Indies*, edn. 1930, London, vol. I, p. 86.

6 I. O. Archives, Letter Book IX, p. 410.

7 *Ibid*, pp. 418, 507, etc. For *bafta*, see Glossary, p. 57.

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PILE CARPETS

At the time of the foundation of the East India Company, oriental pile-carpets were much in demand among the wealthy in England for use as ornamental table-covers. The word 'carpet' was in fact synonymous with 'table-cover'. If a floor had any covering at all, it was usually the medieval choice of rushes and herbs, and as late as 1598 even one of Queen Elizabeth's presence-chambers was indignantly described by a foreigner as 'strewed with hay'[1].

The pile-carpets which had been imported as table-covers from the early sixteenth century were known as 'Turkey carpets', because most of them came from Anatolia, in central Turkey. In the third quarter of the century, however, English travellers reaching Persia had brought home accounts of the superiority of Persian carpets. This encouraged the elder Hakluyt to send an English dyer named Morgan Hubblethorpe to Persia with the following instructions: 'In Persia you shall finde carpets of coarse thrummed wool, the best of the world, and excellently coloured; those cities and towns you must repair to, and you must use means to learn all the order of the dyeing of those thrums, which are so dyed as neither rain, wine, nor yet vinegar can stain. . . . If before you return you could procure a singular good workman in the art of Turkish carpet-making, you should bring the art into this realm, and also thereby increase work to your Company.'[2] We have no evidence that Hubblethorpe's expedition was successful or otherwise, but the story is mentioned because it shows that there was already an interest in the Persian style of carpet in England.

The best pile-carpets of India were at this period not easily distinguishable from Persian work. Although the history and origins of the Indian industry have yet to be studied, the indications are that pile-weaving was first introduced under the patronage of Akbar (1556-1605), who is known to have encouraged the immigration of Persian craftsmen for the purpose.[3] In view of the similarity between the early Indian carpet designs and those of Khorasan, in East Persia, there is hardly any doubt that most of the Persian weavers came from that Province.

The main workshops patronised by Akbar were at Agra and Lahore, and when English factors saw specimens of the carpets made there they immediately recognised them as suitable for the English market. The first consignment of 'Lahore carpets' was shipped from Surat in 1615, measurements varying from $2\frac{1}{2} \times 1\frac{1}{2}$ yds. to $7 \times 2\frac{1}{2}$ yds. At the London sales held in the following year they fetched prices ranging from £2-11-0 to £30 each, according to size.[4]

From the results of this sale, it was obvious that only large carpets would be profitable, and the Surat factors were notified accordingly. However, these were

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[1] From Paul Hentzner's description of Greenwich Palace: J. Nichols, *Progresses and public processions of Queen Elizabeth*, vol. III, p. 424.

[2] Richard Hakluyt, *The principal navigations*, London, 1589.

[3] *Āīn-i-Akbari*, translated by H. Blochmann, vol. I, Calcutta, 1873, p. 55.

[4] I. O. Archives, Court Book IV, pp. 39, 69-70, and 433.

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not so easily got. ' Carpets of such length and breadth as your worships desire them we shall hardly ever be able to procure; for of such sizes we find that very few were ready made, and we perceave, by experience of a few bespoken here, that the tardiness, slowness and poverty of the workmen to be such that it is endless labour to bespeak them, and those bespoken to cost dearer than others ready made. Of the ordinary sizes here made we have sent you all sorts this year, and a good quantity, as hereafter you will perceave; and of other sizes than these you may never expect them, unless we can persuade the workmen of themselves to make them broader; which we will endeavour.'[1] A few days later, the London Directors received a similar letter from the factors at the Mughal court : ' Carpetts of Lahore and Agra, if your Workships have had information that quantities may be had, being bespoken, of those lengths and breadths you have advised for, it is a great error; for to my knowledge there hath been a carpet in Agra house this twelve month amakinge, and yet it is a little more than half done; and they neither make them so well nor good colours as they make them without bespeaking.'[2]

These two letters explain the dilemma in face of which the Company's carpet trade ultimately foundered. On the one hand, the large carpets favoured by home buyers could be obtained only if specially commissioned, and even then only after a long wait. On the other hand, the commissioning of such goods in advance resulted inevitably in lower standards of craftsmanship, since poverty of the weavers was such that, knowing the sale guaranteed, their primary concern was to save on material expended.

As a result of this unsatisfactory position, the Company eventually decided to get pile-carpets only from Persia. They were encouraged in this by the fact that the first Persian carpets sold in London fetched much higher prices than Indian carpets of the same sizes.[3] As it happened, comparatively few Persian carpets reached London, because of the temptations of private trade. The factors soon found that Persian carpets were at a premium in India itself, and it is clear from the records that most of those brought in the Company's ships from ports of the Persian Gulf to Surat were privately sold to Indian buyers at a handsome profit.[4] Thus, supplies to London dwindled in the 1620's, and had apparently ceased altogether by 1631, when ' rich carpets of Persia ' were included with ' pintado quilts ' and embroidered coverlets among the articles in which private trade was henceforth permissible.[5]

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[1] Letter from Agra factors dated 15th December, 1619. *The English factories in India*, 1618-21, ed. by. W. Foster, Oxford, 1906, p. 161.

[2] Letter from Agra factors dated 15th December, 1619. *The English factories in India*, 1618-21, ed. by W. Foster, Oxford, 1906, p. 168.

[3] I. O. Archives, Court Book IV, p. 320.

[4] For evidence of the private trade in pile carpets, see *The English factors in India*, 1624-9, ed. by W. Foster, Oxford, 1909, pp. 55 and 79; also, *Calendar of State Papers, East Indies*, 1625-9, ed. by W. Sainsbury, London, 1860, pp. 93-4.

[5] Royal Proclamation : Public Records Office (London), S.P. 45, vol. 10, no. 150.

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As a result of this relaxing of regulations, there began a practice among the factors in India of commissioning pile-carpets bearing their own coats-of-arms. This practice had been started by Sir Thomas Roe, who in 1617 had commissioned 'a great carpet with my arms thereon.'[1] After 1631, any factor in India could do the same thing, and two carpets of this type are now preserved in London. One, known as the Girdlers' Carpet, was commissioned at Lahore in 1631 by Robert Bell, a Director of the East India Company, and presented to the Worshipful Company of Girdlers (whose arms, together with those of the donor, it bears).[2] The second, in the Victoria and Albert Museum, is known as the Fremlin Carpet, was commissioned by a factor named William Fremlin and bears the coat-of-arms of his family.

After a long period during which no carpets were exported by the Company, the trade was revived on a small scale. Persian carpets appear several times in the London auctions between 1660 and 1682; but prices fetched were disappointing, and in 1686 the London Directors decided to end once and for all further dealings in this commodity: 'You must never send us any more Persian Carpets, for those we had last by way of Surat will not yield us here above a third of what they cost in Persia, which gives us just that cause to fear that we were abused in the price of them, the greater cause of our loss being that such rich carpets are now grown much out of use in Europe.'[3]

WOOLLEN CLOTH

Woollen cloth was England's staple commodity. One would not expect, therefore, interest to be shown in woollen goods of the East. But there was one important exception: the wool derived from goats and used in Kashmir and Persia for the celebrated shawls. The English factors recognised in this wool an excellent substitute for beaver-fur, traditionally used in England for making hats. They also fancied it as a suitable material for ladies' petticoats.

The first consignments of shawl-wool were sent to England in the 1660's and were enthusiastically received. In the last quarter of the century, imports both of the woven and raw material reached large proportions. Most, if not all, supplies came from the Kirman Province of Persia and were shipped via Surat. The woven cloth was known to the factors as 'shawles Carmania', and sometimes simply as 'shawles'.[4]

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1 *The embassy of Sir T. Roe*, Hak. Soc., 2 vols., 1899.

2 Recently republished, J. Irwin, *The Girdlers' Carpet*, The Worshipful Company of Girdlers, London 1962. Also published in colour by G. Birdwood and W. Foster, *Relics of the Hon. East India Company*, London, 1909; in monochrome, Marg Magazine, Bombay, Vol. VII, no. 1, 1953.

3 I. O. Archives, Letter Book VIII, p. 180.

4 The Persian word *shal*, from which 'shawl' is derived, originally denoted a class of woven material rather than a particular garment. The modern association dates only from the late eighteenth century, when 'shawls' became fashionable as articles of wear in Europe. This has been more fully discussed in my monograph, *Shawls: a study in Indo-European influences*, Victoria and Albert Museum, London, 1955.

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Although this was the only woollen cloth bought in the East, there is an interesting reference in the records to the making of a kind of woollen chintz in Jodhpur, Rajputana. The context is itself interesting, for we learn that in 1632, King Charles I, impressed by the Indian cotton chintzes, was curious to see whether the same effect could be obtained on wool. He therefore sent some pieces of broadcloth to the Company and asked that they would have them 'painted' in India in the manner of the chintz. The particular samples supplied by the King were said to have arrived in India in a rotten condition; but in 1633 the Surat factors wrote to London: 'Mr William Fremlen, in his return from Agra passed through Mirta [Jodhpur], the only place where woollen cloth is stained into several colours according to that form which was desired by His Majesty to be practized upon and English white cloth sent out hither for that purpose. What befell that cloth, and how it perished totally past trial of the experiment, hath formerly been advised. Notwithstanding, we intreated Mr Fremlen to inform himself of the order thereof and whether it might not be done upon coloured cloth as well as white cloth; whereunto he replies that it cannot be done but upon white cloth only, and that in pieces not above four or five yards at the most, which is stained after the form of the fine paintings of Masulipatam and put into so many dyevats as there are several colours, that part of it which must not take the dye being covered with a kind of earth; the rest which is uncovered takes the colour of the dye whereunto it is put.'[1]

SILK FABRICS

The silks exported from Western India were mostly fabrics of mixed cotton-and-silk. The only true silks shipped in any quantity were *patolas*, the well-known double-*ikats* of Gujarat. The chief weaving centre of *patolas* was Patan, and they were much in demand as articles of barter for the spice islands, where they were worn as waistcloths. The English Company did not always buy its *patolas* ready-woven, because it was found that 'the cullers best requested will soonest be procured bespoken.'[2] Also, special sizes were wanted for special markets, and the largest (usually listed in the records as 'puttola gobars') had to be bespoken in any case. Not unexpectedly, the factors on the spot were always warning their seniors at Surat that *patolas* ordered in advance could not be expected in a hurry, since the weaving of them was a very slow and painstaking operation.

Another fabric of true silk, less in demand than *patolas*, was called 'culgars'. This was a *printed* silk—the forerunner of the saris of artificial printed silk sold in Ahmedabad to-day as *kalgers*. The latter have patterns simulating tie-and-dye, and it is not unlikely that the seventeenth-century 'culgars' were the same. Many simulated patterns of this type, but printed on cotton, have been found at Fostat, in Egypt, most of them dating from the sixteenth or seventeenth century.

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[1] *The English factories in India*, 1934-6, ed. by W. Foster, Oxford, 1911, pp. 82-3.

[2] *Ibid.*, 1618-21, ed. by W. Foster, Oxford, 1906, p. 102.

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Among mixed cotton-and-silk fabrics were first and foremost those known as 'alachas'.[1] They were a striped fabric, and a clear indication of what they looked like is obtained from original samples of English 'alachas' (made in imitation of the Indian fabric following the notorious prohibition Acts), preserved among contemporary documents at the Public Records Office, London. Some of these samples are of mixed linen-and-silk instead of cotton-and-silk. Besides simple striped patterns of this kind, they were sometimes diapered with floral motives (probably brocaded) or embellished with gold and silver thread. They were popular in Japan as well as in the Near East and the Malay Archipelago, the principal centre of manufacture being the Cambay-Gujarat area.

Another kind of mixed cotton-and-silk fabric was 'cuttanee' (Persian *qutnī*). In pattern somewhat similar to 'alachas', technically they were a satin weave. Of the two, 'cuttanees' were more in demand in Europe, especially in the form of quilts.

The cheapest of the mixed fabrics were 'tapseils', large quantities of which were bought for the West African trade. These were also striped and may have been single *ikats*.

A different kind of mixed fabric was the 'camboolees' of Sind, silk-and-wool instead of silk-and-cotton. They were occasionally bought by the English Company but probably more by the Portuguese, who adopted *cambolim* as a word meaning 'woollen mantle'. Sind also exported other fabrics classified as silk under such names as 'saboons', 'meanaes' and 'adputtaes', but of these we have no exact descriptions.

PLAIN AND DYED CALICOES

Plain and dyed calicoes, ranging from the finest and most expensive muslins to the cheapest and coarsest sackcloth, constituted the main bulk of the textile exports from Western India. For convenience, they will be discussed as follows: (1) plain white calicoes; (2) dyed calicoes, and (3) calicoes patterned in the loom.

1. *Plain white calicoes.*[3] The finest in quality were the muslins, which were bought both as piece-goods, under the name of 'serribaffs' (Persian *shanbaft?*), and in the form of girdles and turban-pieces. 'Serribaffs' were much in demand in Islamic countries for making into shirts or *cabayas* for the wealthy. The

[1] I.O. Archives, Factory Records, Surat, vol. 102, p. 263.

[2] Similar cloth was made under this name in Bengal; but the 'alachas' of Western India were woven with a higher proportion of cotton. This sometimes led to their being classified in the records as calicoes rather than silks.

[3] The classification adopted is inevitably somewhat arbitrary, for many of the calicoes included here among 'plain white' were on occasions dyed; and conversely, many of these classed as 'dyed' were sometimes sold as white cloth. The heading under which they are discussed here is determined according to how they were *most commonly* marketed.

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English bought large quantities of both kinds for sale to the Levant Company and re-export to North Africa and Turkey (see pp. 6-7 above). Turban-pieces were known as 'shashes' (Arabic *shāsh*, muslin), the best girdles as 'guldars' (Persian *gul-dār*, flowered) and 'sallowes', both of which had their heads brocaded or embroidered, sometimes with gold and silver thread. Most of these fine muslins came from the Burhanpur region, which was the main muslin-weaving area of Western India in the seventeenth century.

The generic term for the ordinary white cotton cloth of Gujarat was 'bafta' (Persian *bafta*, woven). This was mainly woven at Broach and Nosari (modern Navsari) in both fine and coarse grades, the former being about double the price of the latter. Usually they were bought either as 'broad baftas', measuring 14 × 1 yds. or as 'narrow baftas', 14 × ¾ yds. On account of their good value they found a ready sale in most markets. 'The narrow baftas of Surat and Nunceree [Nosari] making are the most true and substantial cloth of all India', commented the factors.[1] After the great Gujarat famine of 1630, which hit both Broach and Nosari with great severity, attempts to imitate the cloth were made in many other parts of India, so that henceforth the term lost its local significance. Sind 'baftas', the main substitute, were known also under such local names as 'joories' and 'dorbellas' (after Darbelo, in Hyderabad Dt.).

In more or less the same class of ordinary white cloth as 'baftas' were 'semianoes', 'mercoolees', 'cannikens', and 'byrams', each of which is discussed in some detail in the Glossary. 'Semianoes', after Samana in Patiala where they were woven, were preferred above all for the English home market on account of their being unusually broad. For years the factors had been unsuccessfully urging Broach and Nosari weavers to increase the width of their cloth (which was seldom more than one yard) so that it would compete on more favourable terms with European linens; the fact that 'semianoes' were usually an extra eighteen inches in breadth was a big mark in their favour. Typical of the confusing information provided by the East India Company records is the fact that once the word 'semianoes' had come into circulation as implying Semana cloth of certain dimensions, it was then applied loosely to any plain calico of these dimensions whatever their provenance. Thus, in 1614, we find the factors recommending 'semianoes' from Akbarpur, near Lucknow.

Besides the ordinary grades of white cloth, the Company was interested in the most coarse. The latter gave to the English language the two words 'gunny' and 'dungaree', although—as usual in such cases—once assimilated, the original meaning gradually changed. The English 'gunny' of to-day is jute or hemp-cloth, whereas it features in the seventeenth-century records as a coarse cotton cloth bought for making into sacks (Sanskrit, *goni*, sack). 'Dungaree', in modern English usage, denotes a type of garment or overall, but originally was coarse cotton piece-good material from the Rajapur area, north of Goa.

Two other grades of cheap cotton played an important part in English trade. These were 'dutties' and 'seryas'. The former were a strong coarse cloth

[1] I. O. Archives, Factory Records Miscellaneous, vol. 25, p. 56.

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used mainly for mending sails and as a packing material; the name is probably the same as modern Gujarati *doti*, a coarse cotton cloth. They were a speciality of Dholka, near Ahmedabad. 'Seryas', woven mainly at Broach and Ahmedabad, was very strong cloth, both plain and striped, much used as sailcloth and for flags. It was also sold in England for use as napkins and towels.

2. *Dyed calicoes.* As chintz exports have already been discussed, we are concerned here only with the more commonplace types of unfigured, dyed cloth. The buying of this cloth engaged much of the factors' time, because the sorts wanted were rarely to be had without advance ordering. Moreover, areas which produced the most suitable cloth for dyeing were not always those with good dyers. For instance, the largest quantities of the most suitable cloth were woven around Lucknow; the best dyers of plain goods were to be found near Ahmedabad. Thus, the Company was obliged to buy the white cloth near Lucknow and to bring it to Ahmedabad for dyeing.

Sanganer is another place mentioned at this period as a centre for the dyeing of plain goods. There is no indication in the records, however, that it had yet become a centre of the chintz industry—as it is to-day.

3. *Calicoes patterned in the loom.* The favourite phrase used in early records to describe goods of this kind was 'calicoes dyed in the thread before making': meaning simply that they were woven with different coloured threads. In this way it was intended to distinguish them from the calicoes dyed *after* weaving.

These cloths were exported mainly for the slave populations of both the East and West Indies. As already mentioned, they were grouped under the generic term 'guinea cloths' or 'guinea stuffs', after the Guinea Coast of West Africa, which was the main source of the slaves sent to the West Indies. They were mostly striped or checkered, listed in the Glossary under such names as 'brawles,' 'buttanees', 'capperees', 'carolees', 'chelloes', 'chirans', 'cherconnas', 'chuckerees', 'hussanees', 'populees', etc. It was the brightness of their colours (and the fact that they kept their brilliance after washing) which took the negroes' fancy. Towards the end of the century, the English merchants trading with Africa tried to challenge the East India Company's monopoly in the supply of such goods by commissioning English weavers to copy many of the Indian cloths.[1] But results of such attempts were never very successful. 'East India goods only and not those imitated are saleable', wrote one of the local African Governors in 1706.[2] This comment was frequently to be repeated in later despatches.

SUMMARY

From this survey it is possible to derive a general picture of Western India's role in the textile trade of the seventeenth century. At the beginning of the

[1] On one occasion the Africa Company employed 700 English weavers to imitate 'niconees, tapseils and brawls' in mixed cotton-and-wool. A. P. Wadsworth and J. de L. Mann, *The cotton trade and industrial Lancashire*, Manchester, 1931, p. 126.

[2] *Ibid*, *p.* 151.

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period, we find Gujarat commanding first place in India's trade with the West, ahead of both Bengal and the Coromandel Coast. At this time she was chiefly famed for cheap calicoes of good, serviceable quality, while also exporting large quantities of high-class muslin mainly woven in the Deccan. Her cheap resist-dyed calicoes were also much in demand both in the Middle East and in the Malay Archipelago.

This prosperity received a big set-back from the disastrous Gujarat famine of 1630-32; and when, after several decades, trade recovered, it was with some change of character. For instance, many of the cheap cotton and silk piece-goods earlier associated with Gujarat were now being produced in Sind, Punjab and U.P., while local specialization turned increasingly to chintz. Meanwhile, European trading companies were concentrating more and more upon the development of their settlements on the Coromandel Coast, mainly on account of the advantageous political concessions they had been able to secure there. At the end of the seventeenth century, Gujarat trade declined and lost parity with the Coromandel. Its next phase of recovery had to await development of the power-loom in the modern period.

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CHAPTER II

South India

THE main area of textile manufacture in South India was the Coromandel coast—a term used here in its seventeenth-century sense, meaning the belt of coast stretching from the Godavari delta in the north to Point Calimere in the south. From at least as early as the period of Roman trade (first and second centuries A.D.) this region ranked with Bengal and Western India as one of the three main areas of Indian textile commerce.[1]

In the centuries immediately before the arrival of the European trading companies, Coromandel textiles were already well established as the principal articles of barter in the spice trade of the Malay Archipelago, and without these textiles it was difficult for merchants of any nation to get spices on economic terms. Owing to the undeveloped economies of the spice-islands, there was little use for bullion, and no stable demand for any foreign commodity other than clothing. The result was that spice-trade with the West was three-cornered. Ships, mostly manned by Arabs, left the Red Sea and Persian Gulf with bullion, first to be exchanged in India for textiles. The textiles were then carried by the same ships to the Malay Archipelago and bartered there for spices. Finally, the ships returned direct to the Middle East laden with spices, which were then converted into bullion for another round of the same journey.

When the Portuguese arrived at the end of the fifteenth century they found this profitable barter trade as it had been for centuries, mainly in Arab hands. In the following century they succeeded in usurping it for themselves, diverting its entrepots from the Middle East to Western Europe. In the seventeenth century it was once again usurped, this time by the Dutch and by the English. But all the time the essential workings of the trade and its dependence on barter remained the same.

The Indian textiles which proved most suitable for barter were first and foremost those of the Coromandel Coast. They were limited to certain easily defined types, each local market in the Malay Archipelago having its own strictly conservative tastes based on custom and convention. This conservatism was often carried to extremes and could prove exasperating to merchants when they discovered that some seemingly trivial inconsistency of pattern rendered a whole shipload of piece-goods unacceptable to some particular market. A merchant carrying Coromandel piece-goods to a port in the Malay peninsula in 1613 noted in his journal: " . . . A great oversight hath been committed in the bespeaking

[1] The traditionally accepted derivation of the term Coromandel is *chola-mandalam*, lit. 'the realm of the Cholas'. The Chola Empire of S. India flourished at its height in the tenth and eleventh centuries A.D.

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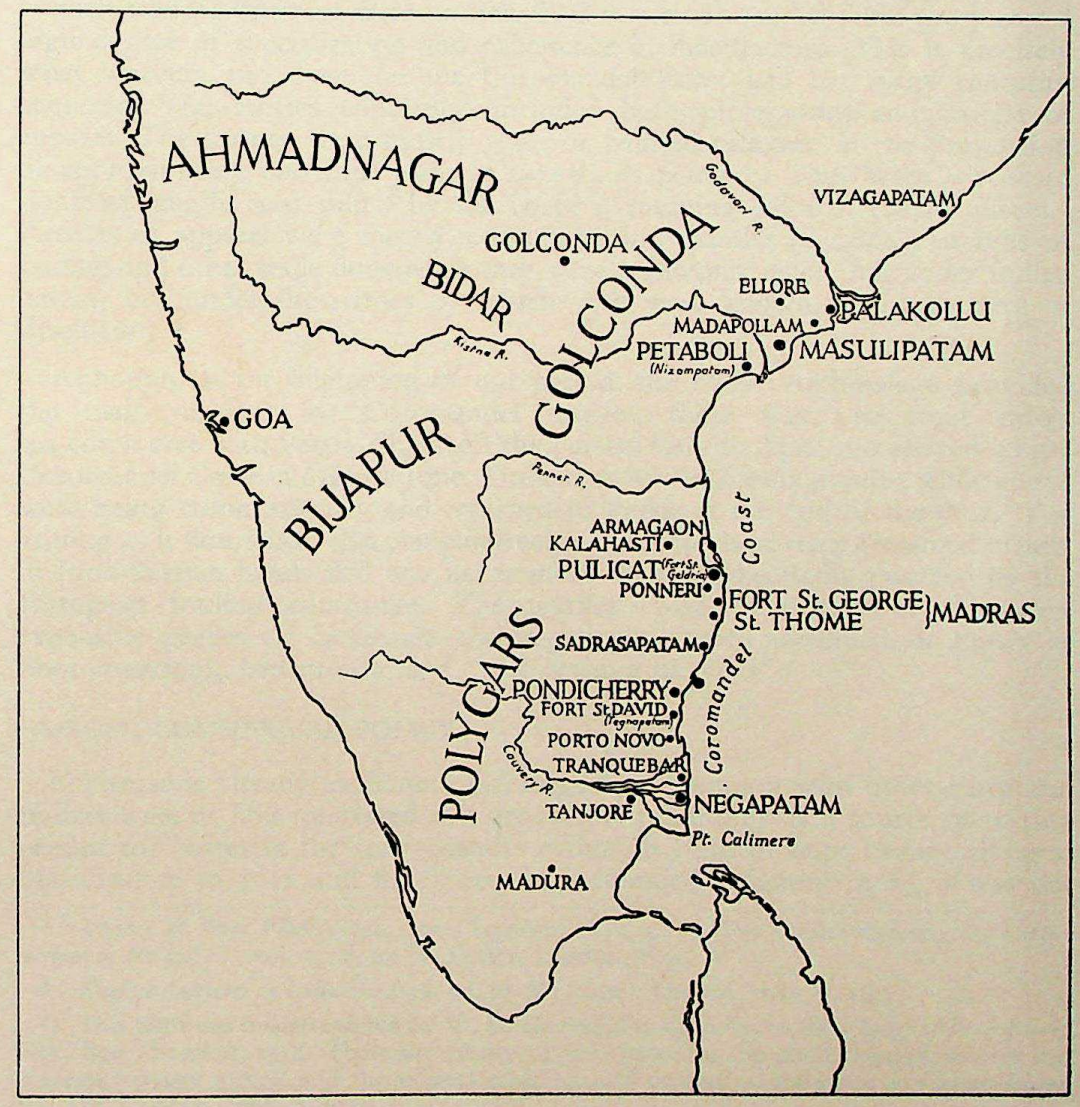

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of the foresaid Maleys cloth . . . for they have all of them a little narrow white edge, and the upright [i.e. correct] Maleys cloth must be without it . . . wherein the Maleys are so curious [i.e. particular] that they will not once put forth their hands to look upon them; and, if I had not now found it by experience, I had never believed it, that so small a fault should cause so great an abatement in the price."[1]

Such fastidiousness of taste on behalf of buyers demanded from producers a high degree of specialization and experience in manufacture. This is precisely what weavers and dyers on the Coromandel Coast had for many centuries acquired. The fabrics concerned included both piece-goods and articles of apparel. The former were mostly plain or painted calicoes, in the proportion of approximately one-third plain to two-thirds painted.[2] They were woven in standard lengths and sold "by the corge", meaning a lot of twenty pieces.[3] Articles of apparel were mostly waistcloths and mantles (*dupattas*); in Bills of Lading and other trade documents they were commonly listed, not under Indian names, but under the names by which they were known in the country of destination.[4]

Although, at the beginning of our period, the Malay Archipelago provided the main markets for Coromandel textiles, there was also some direct sea-commerce with Persia. Ships left the Persian Gulf in April and arrived off the Coromandel Coast in May or June. There they waited for six months while goods were being commissioned, and returned to Persia at the end of the year.[5] For as long as it flourished, this comparatively small branch of trade remained mainly in Indo-Persian hands and was never more than half-heartedly poached by the European trading companies. The textiles consisted mainly of the more expensive grades of Golconda cotton-painting, much esteemed in Persia as floor-coverings, bedspreads, and "the lyninge of coats".[6]

ENGLISH COMMERCIAL POLICY

For reasons already explained, the English in common with other European traders were at first interested in Coromandel trade only as a source of textiles needed for barter in the spice-islands. Although English ships began calling at Masulipatam in 1611 and four years later founded a factory there, it was not

1 *Voyage of Peter Floris*, Hak. Soc., London, 1934, p. 71. For similar instance, see *Letters received by the E.I.C.*, vol. 3, ed. by W. Foster, London, 1899.

2 *English factories in India* 1634-36, ed. by W. Foster, Oxford, 1911, p. 161.

3 This term was misinterpreted by W. H. Moreland in his notes to the *Voyage of Peter Floris*, Hak. Soc., London, 1934. There are plenty of indications in the contemporary records that it meant twenty pieces, and the correct meaning and derivation are given in *Hobson-Jobson*, 2nd edn. London, 1903, p. 255.

4 For instance, waistcloths intended for Java were called 'tappechindæs', from Javanese *tapih*, skirt; and Hindi, *chint*, chintz.

5 *English factories in India* 1642-45, ed. by W. Foster, Oxford, 1613, p. 87. The well-known French traveller Tavernier first reached India on a ship plying this trade: *Travels*, I, 255.

6 Letter from an English agent in Persia dated 1618, India Office Archives, Official Correspondence, vol. VI, nos. 192 and 699.

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until 1649 that any English vessel returned direct to England from the Coromandel.[1] During most of the preceding period English trading on the Coast was controlled from the East India Company's headquarters at Bantam in Java and was entirely subservient to the needs of the spice-trade.

Masulipatam, situated in the former Muslim-ruled state of Golconda, was the natural first choice for a settlement because it had the only good harbour on the coast; but it was soon found that stable relations were impossible there in face of the corrupt and oppressive local administration.[2] Both Dutch and English realised that better prospects were offered by negotiations with Hindu rulers to the south of Golconda. The Dutch accordingly established their main base at Pulicat; and the English first at Armagaon (1626), and later at Madras (1640). Henceforth English trading activities were concentrated mainly in the Madras area, although Masulipatam was never entirely abandoned and retained its importance both for plain calicoes and the finer grades of chintz.

The idea of sending Coromandel textiles to England was first mooted in 1621. In that year a few samples of plain cotton cloth were sent to London via Java, with the suggestion that they might be more suitable for the English market than the equivalent piece-goods of Western India.[3] But the suggestion was ignored, and it was not until the next decade, when the disastrous Gujarat famine had interrupted supplies of local cloth to London, that the idea was again revived. It was assumed, however, that since Gujarat cloth was now well-established on the London market, any Coromandel substitute should be an imitation of it. Accordingly, Coast factors were encouraged to experiment with the copying of Gujarat cloth, and in 1645 they reported some success. All that was needed, they said, was for the Surat factors to send to the Coromandel Coast "a skilful workman for their well making up and the glazing of their heads."[4] At this stage, however, the Coromandel was itself hit by famine hardly less devastating than that suffered in Gujarat. In 1646, Pulicat and St. Thome were each reported to have lost 15,000 from starvation, and Madras itself 4,000. It was further estimated that at least two-thirds of the weavers and dyers working for the Company died of starvation,[5] and as a result plans for the sending of Coromandel cloth to London were temporarily forgotten.

Not until the 1660s did trade revive. Then, for the first time, we find the London Directors making substantial orders for Coromandel textiles to be sent

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[1] Some small consignments of Coromandel textiles had before this reached London indirectly, via the Malay Archipelago, but they had been brought home more for their curiosity value than as part of a regular trade.

[2] Golconda was ruled by Muhammedan usurpers of Persian descent. The evils of administration were attributed by Dutch and English traders to an infamous custom of farming out revenue appointments to the highest bidder. In this connection, see esp. *Relations of Golconda*, ed. by W. H. Moreland, Hak. Soc., 1930, *passim*.

[3] *English factories in India*, 1618-21, ed. by W. Foster, Oxford, 1906, p. 343.

[4] *English factories in India*, 1642-45, ed. by W. Foster, Oxford, 1913, p. 287.

[5] *English factories in India*, 1646-50, ed. by W. Foster, Oxford, 1914, p. 163.

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to England.[1] Plain cotton goods at this stage were the main demand; but from 1680 onwards chintz exports to Europe became increasingly important, giving rise to a fashion which reached its peak in the last decade of the century.

The Persia-Golconda sea-trade which, as earlier explained, flourished simultaneously on a comparatively small scale, did not at any time seriously engage the English. They were well aware of its lucrative possibilities,[2] but constant shortage of capital for their primary needs seldom allowed them to participate.

TRADING METHODS

Trading methods on the Coromandel Coast differed to some extent from those employed in Western India and described in the previous chapter. This was partly because, whereas in Gujarat and Sind weavers working for the Company were mostly concentrated in or near market towns, in the south they were widely scattered among inland villages.[3] This meant, on the one hand, that more brokers were needed to commission goods and to supervise manufacture; and, on the other, that weavers were given every encouragement by Europeans to abandon their villages and to settle under the 'protection' of the foreign trading settlements.

The Coromandel weaver was surprisingly mobile. He worked always in the open, sheltered only by a tree, and as owner of his loom he was free to set it up where he liked. This mobility meant that he was ready to move from one area to another if better conditions were promised, and when the English Company wanted to encourage weavers to settle near their factories their only preparation was to plant an avenue of trees. The more oppressive the local administration,

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[1] Long prior to this, chintz had been reaching Europe from Western India. In this connection, see the previous chapter.

[2] In 1633, the Company's factors in Persia wrote: "If there were a stock of £20,000 at Masulipatam, to be invested in such commodities as that country doth afford, bought at the best hand when the time of year affords, and brought hither, it would yield you more certain gain and advantage than any commodity you can send from England here; I proportion at least cent per cent profit. The return is short and without danger, for the stock adventured from Masulipatam in June will be here in September, and may be returned in March next, when the ships go thither to load up." *English factories in India*, 1630-33, ed. by W. Foster, Oxford, 1910, p. 296.

[3] Corrupt transliterations of place-names present great difficulty of identification, but with the generous help of Dr. V. S. Krishna, Vice-Chancellor of Andhra University, I have been able to identify the main areas of specialization in Golconda from names given in contemporary records. Fine cotton-painting came mainly from the Palakollu area, at the delta of the Godavari, and Petaboli (Nizampatam), where painters worked directly under merchants' supervision. Coarse and ordinary grades of cotton-painting came mainly from villages in the Bezwada area, stretching from Mustabada in the north, to Mangalagiri and Battiprolu in the south (all these places are marked on the Southern Railway time-table map). Fine muslins came mainly from villages in the Warangal area, and other types of plain calico—especially Longcloth, Percallas and Salempores—from the coastal area between Vizagapatam in the north and Masulipatam in the south, and extending inland as far as Ellore. Masulipatam itself was not an important producing centre, although justly famed as "the great bazar . . . for above 100 miles in circuit" (Thomas Bowrey, *The countries round the Bay of Bengal*, 1669-79, Hak. Soc.. London, 1903, p. 106).

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the more eagerly weavers and dyers moved into the foreign settlements for protection. This at times proved an embarrassment. For instance, when negotiations took place in 1634 between the English Company and the Golconda rulers for " the sole governmnent " of Mallavol, near Masulipatam, the population at once " doubled itself in magnitude, soe fast doe the poore people flocke hither from the Moorish tirrany."[1]

The majority of weavers were too poor to buy their own materials and thus had to depend upon the brokers for advances. In this way, foreign traders were able to exercise a hold over the industry. Sometimes advances were made in kind (yarn or rice, or in the case of cotton-painters, cloth and wax), but more often they were money payments. The usual procedure was for the Company's agents to issue brokers with musters of the goods required and instructions as to the maximum prices to be paid. These musters were stamped with the Company's indelible seal and given to the weavers with their advances. On delivery of the finished cloth at the Company's warehouse, the agent decided whether it compared satisfactorily with the original muster; and if not, a correspondingly lower price was paid.[2]

In practice, there were differences in the commissioning of fine, as distinct from coarse, cotton goods. Writing in 1678, the Masulipatam factors explained that the fine grades were " provided by persons of as plentiful Estates as reputation and experience, and therefore need no further anticipation of moneys for carrying on the work, that what by practice they have brought into Custom, that is one moyety [i.e. half-payment] upon contract . . . they in reality not being in want of moneys, but having their stocks employed in procuring the goods which are constantly required. But for the ordinary calicoes the case is much different. The persons employed in procuring them, though equal in point of integrity and diligence, yet much shorter in Estates, not having so plentiful a stock of their own as to carry on a work of that magnitude without present supplies of money. Besides the work itself being gross and voluminous requires more hands in the manufacture, and thereby becomes dispersed, more up and down the country; and thereby becomes exposed to a greater charge in those who are to attend and look after it, which they who deal in fine calicoes well understanding have all along peremptorily refused to be concerned in, until this year, when more out of jealousy to be supplemented than any other motives consented to undertake a proportion."[3]

Brokers employed by the English Company were at first mostly members of the Telegu-speaking Komati caste,[4] but later in the century, when trading

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[1] *English factories in India*, 1634-36, ed. by W. Foster, Oxford, 1911, p. 48.

[2] *Records of Fort St. George : Despatches from England* 1670-77, Madras, 1911, p. 23.

[3] I. O. Archives, Masulipatam Factory Records, vol. 2, consultation dated August, 1678.

[4] This was a well-organized trading caste which employed its own secret trading language and judicial code (see Thurston, *Tribes and castes of South India*, s.v. Komati). In the English records the word was usually spelt " Committee ".

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activities were concentrated further to the south, in the Madras area, the brokers were mostly Tamil. Individual brokers sometimes achieved positions of great power and influence, especially under the Dutch who favoured a policy of granting monopolistic powers to only a few brokers. The English, on the other hand, preferred to distribute commissions among a large number of " inferior committees [Komatis] " in the hope that competition among them would help to keep prices down.[1] In the last quarter of the century, brokers employed by the English were organized into a permanent, disciplined body and given a stake in the Company's prosperity. This body was termed a ' Joint Stock ', repersenting 100 shares, unequally divided among the participating merchants. Forty-five per cent. of the shares were held by nine ' Chief Merchants ' who were responsible to the Company for " managing, directing and ordering " all goods required by the Company.[2] This arrangement seems to have been partly forced on the Company, for it was found that " unless the Merchants have a hand in the bargain and management and also some share in the profit, they will baffle all endeavours by the underhand influence they have upon the castes."[3]

On the whole, Coromandel brokers enjoyed happier relations with producers than did their counterparts in Western India. The disaffection of the Coromandel weavers and cotton-painters seems to have been directed less against the broker than the tax-collector whose behaviour was correspondingly more oppressive, especially under Muslim rule. In Golconda particularly the producer was taxed ruthlessly. A letter of 1614 reports how cotton-painters defied tax-collectors by bringing their goods to one of the English factories " in a hugger-mugger and in the night as thieves do their stolen cloaks . . . "[4]

In spite of the foreign traders' temptation to accept goods direct from producers, they were on the whole reluctant to by-pass the broker and thus alienate him. In the long run the broker's co-operation and goodwill were indispensable, and in 1622 the Pulicat factors wrote that if direct dealings with weavers were extended, then " at the yeares end, when we expected to be invested of our goods, we should undoubtedly come short of half our quantity, besides undergo a hazard of their running away where there was no hope for us to find them out or recover our monies."[5] Later, the same anxiety about weavers " running away " led to the Company's practice of having cloths stamped while still in the loom, thus making them unsaleable to any other buyer.[6]

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1 *English factories in India*, 1624-29, ed. by W. Foster, Oxford, 1909, pp. 8-9.

2 *Records of Fort St. George : Diary and Consultation Books* 1680-81, Madras, 1912, p. 47. Another ' Joint Stock ' was formed for the washers and bleachers working under the Company at Madras (*ibid*, 1681, Madras, 1913, p. 22).

3 *Records of Fort St. George : Public dispatches to England* 1694-96, Madras, 1919, p. 40.

4 *Letters received by the E.I.C.*, 1613-15, vol. II, ed. by W. Foster, London, 1897, p. 85.

5 *English factories in India*, 1622-23, ed. by W. Foster, Oxford, 1908, p. 104.

6 This practice was introduced in 1699, when the London Director wrote: " We entirely approve of your giving the merchants a seal to chop every piece of cloth withall begun on our account at first putting into the loom, the good effects of which are very easily apprehended." I. C. Archives, Letter Book X, 230.

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There is no evidence that *printed* as well as *painted* cottons were made on the Coromandel Coast in the seventeenth century—a surprising fact in view of the large printing industry which flourished there in the late eighteenth and nineteenth centuries. The earlier dyeing techniques appear to have involved only the use of brush or pencil and not the print-block.

Goods of this kind varied from the finest and most expensive made in India, to the coarsest and cheapest produced chiefly for export to the Malay Archipelago. Golconda was widely renowned as the source of the best work,[1] but the actual quantity produced there was never large. The Frenchman Tavernier who visited Golconda in the middle of the century, remarked that after engaging all cotton-painters in the area one would have difficulty in getting from them as many as three bales of such goods.[2] This scarcity was all the more felt in view of competitive buying from agents of the Mughal and Deccani courts, where Golconda cotton-paintings were much coveted. In 1646 the English factors complained that the ruler of Golconda went as far as to insist that all cotton-painters should work only for him.[3]

A short, vivid, yet somewhat arrogant, description of how the cotton-painters worked is given by the Dutchman Daniel Havart, who was for some years an agent for the Dutch Company on the Coast. Describing Palakollu, at the delta of the Godavari river, he says : " Chintzes are painted here according to musters which are given to the painters which they then imitate completely and extremely well, for their national character is so stupid that they cannot imagine anything by themselves, but can only imitate something so that it has a complete likeness. But one chintz is not always as good as another, although both painted by the same hand. For painting they use the Chintz Parecala [see Appendix, s.v. Percallaes] of 12 covids long, that is somewhat more than 8 ells. There are four kinds of painters each with a special family name. Among them are divided the orders, and they charge those again to those lower in rank who do the work. They are mostly poor people, who in order to pay their debts and yearly taxes have to be kept in employment, or they would become ruined [by debts] and this is the reason why more chintzes are ordered at Palicol [Palakollu] than in the South . . . This painting of chintzes goes on very slowly, like snails which creep on and appear not to advance. Yes, he who would wish to depict Patience

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[1] The superiority of Golconda chintz was commonly attributed to the better materials available locally. For instance, chay-root grown on the islands of the Kistna delta and used for madder was said to be the best in India ; and indigo grown in Golconda was far superior to that grown further south.

[2] F. Tavernier, *Travels*, II, ch. xii.

[3] *English factories in India*, 1634-36, Oxford, 1911, p. 161. For Dutch evidence, see H. Terpstra, *De vestiging van de Nederlanders aan Kust van Koromandel ;* and by the same author, *De Nederlanders in Voor-Indie bij de stichting van het fort Geldria te Paliacatta*, De Indische Gids, Amsterdam, vol. LXXIII, 1915, pp. 331-360.

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would need no other object than such a painter of Palicol [Palakollu]."[1] To this colourful picture of cotton-painters at work may be added John Fryer's contemporary observation that " little children " as well as adults were engaged in the work, " . . . they stretching the pieces on the ground, and sitting upon them, run them over with a dexterity and exactness peculiar to themselves."[2]

It was not until about 1680 that the English Company began to show a serious interest in the bulk export of Coromandel cotton-paintings to Europe. The first large order was sent in 1682, when the Masulipatam factors were asked to supply " 45,000 Percallaes [see Appendix], the finest sorts, made into Chintz 8 yards long, full yard broad, the grounds to be green purple, red and some white, but the best paintings to be upon purple ground with variety of painting, curious and lively brisk colours . . . "[3] At about the same time the London Directors began ordering coverlets for beds and tables, to the value of £500 per shipment.[4]

The first indication that these goods were well received at home came later the same year, when orders were extended to include painted-cotton bed-hangings described as follows : " 100 Suits of painted Curtains and Vallances, ready made up of Several Sorts and Prices, strong, but none too dear, nor any overmean in regard you know our Poorest people in England lye without any Curtains or Vallances and our richest in Damask, etc. The Vallances to be 1 foot deep and 6½ yards compass. Curtains to be from 8 to 9 foot deep, and two lesser Curtains each 1½ yards wide, the two larger Curtains to be 3½ yards wide. The Tester and Headpiece proportionable. A Counterpane of the same work to be 3½ yards wide

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[1] Daniel Havart, *Op-en ondergang van Cormandel*, vol. III, Amsterdam, 1693, pp. 13-14 (The translation given here has been made with the help of Dr. J. E. van Lohuizen-de Leeuw, of Cambridge University.) There follows a brief description of the technique employed at Palakollu : " First they receive the rough cloth, then they wash it white, then they beat some karkayl, put it into milk, wherein the white cloth is put, and afterwards it is dried; after that they fold it according to their manner and beat it smooth in order that it would be more close; then they sponge over it, and they make paint of certain redwood, wherewith the first draught is done on the sponge, and when they desire to have several colours, for instance, red, violet, green, etc., then all those places are rubbed with Alum-water they mix each according to his knowledge, and are further painted according to the musters which they have lying at their sides." My colleague Monsieur P. R. Schwartz identified this rather obscurely-described process with the Beaulieu-Coeurdoux account (soaking in a fatty aqueous astringent solution). "Personally", he writes to me, " I think that *karkayl* must be something like cadou or myrobolan." He refers me to a similar point of view expressed by Jenny-Truempy, *Handel et Industrie des Kantons Glaris*, 1900. The word used by Havart for cloth is " linen ", but it is obvious that it is meant here in its broad contemporary sense of any cloth made from vegetable fibre, cotton as well as flax.

[2] John Fryer, *A new account of East India and Persia*, Hak. Soc., London, 1909, vol. I, p. 90.

[3] *Records of Fort St. George : Despatches from England*, 1681-86, Madras, 1916, p. 21.

[4] I. O. Archives, Letter Book VII, 136. They were at first half-hearted in enthusiasm ; " . . . none of them did yield any great profitt ; but not being willing to loose any commodity we hope your endeavours will be the more to buy them cheaper, that we may increase their vent." The dimensions required were stated as follows :

For Tables, 3 yds. x 2½ yds.
For Side Boards, 2 yds. x 1½ yds.
For Beds, 5 yds. x 3½ and 4 yds.

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and 4 yards long, half of them to be quilted and the other half not quilted. Each bed to have to it 2 small Carpetts, 1½ yards wide and 2 yards long. Each bed to have 12 Cushions for Chairs of the same work. By the ships you shall have *variety of patterns* [my italics, J.I.][1] and further directions, but be doing what you can in the meantime. Possibly some of these things may gain that repute here as may give us cause of greater enlargement in them hereafter, which will not only be a benefit to the Company, but to our inhabitants of the town of Madras."[2]

The Coromandel factors found themselves ill-prepared to meet these new demands for a superior grade of cotton-painting. Their factories in Golconda had hitherto been organized only for the supply of plain woven cloth, and recent political unsettlement in the area (Golconda itself had been subjugated by Mughal forces) offered poor prospects for settled trade of any kind. The only alternative was to create a specialized cotton-painting industry in the environs of Madras itself, and this the factors promptly tried to do. As a first step, the following notice was nailed to the gates of Fort St. George (Madras): " We the Agent and Council of Fort St. George for Affaires of the Hon. East Indian Company do hereby invite all Merchant inhabitants of this town of Madraspatam and all others to bring and produce to us all variety of Musters of Paintings and Callicoes whatsoever is made in this Country, and also of any new invented sorts,[3] that can be made thereabouts or brought hither, and we shall contract with them for large quantities . . . "[4]

Not content to recruit the best cotton-painters of the Madras area, the Company was determined to encourage the settlement of the best Golconda painters as well. In 1694 the London Directors wrote: "We are well assured that Masulipatam is become almost desolate, not one house of almost a hundred inhabited. We hope some of those fine painters that used to live there are come to inhabit in Madras, if they are not, we desire you by all the means you can contrive to find out the place of their present residence, and invite them to inhabit in our society of Madras, giving for their encouragement assurances of a constant

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[1] The sending out of sample patterns from England for cotton-painters to copy adapt seems to have been the general practice on the Coromandel Coast as well as in Western India. In this connection, see my article, *Origins of the 'Oriental Style' in English decorative art*, Burlington Magazine, London, vol. 97, April, 1955.

[2] I. O. Archives, Letter Book VII, 208. There are indications that these "suits of painted curtains", when eventually received in London, found a poor market. In 1685, the London Directors stopped further orders, because twenty sets (160 pieces) remained unsold (Letter Book VIII, 43). In the following year, 100 Coromandel palampores were also reported unsold (Letter Book VIII, 251).

[3] Reference to " new invented sorts" was doubtless made in deference to the London Directors' request at this time for " all the variety of new sorts than can be, especially for paintings . . . " (This of course refers to chintz *piece-goods*, not palampores and bed-hangings.) This demand reflects inconsistency on behalf of the Directors, who in 1681 had written that " new stuffs work upon the old ones as dried Spratts do upon Red Herrings, the former pull down the price of the latter though they be not directly the same (Letter Book VII, p. 51.)"

[4] *Records of Fort St. George: Despatches from England*, 1681-86, Madras, 1916, p. 16.

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employment which we would have you perform with them accordingly . . . "[1] These instructions were frequently repeated in subsequent letters, notwithstanding replies that the water of Fort St. George was unsatisfactory for dyeing.[2] By 1696 the appeal had become urgent: "We have writt so much formerly concerning your procuring of fine painters to inhabit Fort St. George . . . that we can add little, but to desire you to give no rest to your thoughts and endeavours, until you have obtained some number of those Artificiers *that can work to the perfection of a Pattern that will be sent you by Mr. Ongley* [my italics, J.I.].[3] And let them use their own fancyes in those works and colours which they can best perform, for it is not material what the fancyes or works the Patterns are, so they be finely done and lively colours."[4]

By 1700 this policy was beginning to bear fruit. In a private letter Governor Pitt wrote from Madras: "I have with all diligence encouraged the painting trade, and have been at some charge to do it. Without any manner of partiality I think we far outdo Masulipatam and hope by the next ship to send you a thousand pieces such as never were seen in the world, if I can but keep these cursed fellows from mixing the Southern Chay with the Northern, the latter being the best and costs much more."[5] But the "next ship" to which Pitt referred probably reached England too late to reap full commercial benefit for the Company. In the same year the English Parliament passed the first of its Prohibition Laws, forbidding the sale in England of Indian painted calicoes.

However, the first Prohibition Law proved to be only a temporary setback, and as far as the chintz trade was concerned it soon became a dead letter. According to the terms of the Law, Indian chintz could be imported into England only for re-export. This resulted in merchants *pretending* to buy for re-export, whereas in fact the ships supposedly carrying the goods to continental ports secretly unloaded them at remote spots on the Kent or East Anglian coasts. This clandestine trade was organised on such a scale that by 1719 even the Government had to admit that there were "more Callicoes worn in England that pay no duty than what are painted and worn here that do pay duty . . . "[6] The

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1 I. O. Archives, Letter Book IX, 307.

2 I. O. Archives, Letter Book IX, 486. This difficulty was apparently overcome by the fact that the water of neighbouring Fort St. David was found more suitable (Letter Book X, 32).

3 See my fn. 1, p. 31.

4 I. O. Archives, Letter Book IX, 466.

5 Letter dated 11th February, 1700, British Museum,—Add. Ms. 22842, f. 31. In the same letter, Pitt remarks: "I have sent Captain Browne some few Pallampores and some Chints made here, and some other Chints *painted both sides alike* . . . " This is the only evidence I know for the existence of chintz *painted both sides alike*. Presumably he meant chintz consisting of a single thickness of cloth painted on both sides, and not simply two separate pieces sewn back-to-back to give the effect of a single piece. Chintz of the latter kind was sometimes bought in Western India. For instance, in 1619 the Surat factors asked their Agra agents to buy quilts "all of one kind of chintz, the lyninge and upper parts of one and the same; some of different chintes, yet such as either side may be used . . . (*English factories in India*, 1618-21, ed. by W. Foster, Oxford, 1906, p. 84)."

6 Memorandum submitted to the Lords Commissioners for Trade and Plantations, dated 19th November, 1719. Public Records Office, London, C. O. 388/21, f. 250.

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selling of these illegal goods was largely in the hands of peddlars who bought them at the coastal ports and then sold them from door-to-door throughout the country.

In the previous chapter, dealing with the trade of Western India, appeared a list of the Company's orders for painted cottons from that part of India for the year 1695-6. For comparison, we shall close this section with a list of Coromandel orders for the same period :

20,000 Chints, Gulcondah, Brampore, as much variety as may be, but 50 at least of each work, some purple and some dark coloured grounds, some red grounds, a few greens. But the greatest quantity white grounds, some purple flowered, some red flowers. Note half the quantity to be upon stripes, and half upon flowers, and some both striped and flowered.

10,000 Very fine Metchlepatam paintings, the finest can be made, done by the neatest hands can be got, done upon fine thick cloth, such as Metchlepatam Sallampores, Morees, Longcloth, as much variety of works, new fancyes of the country's invention, nothing like English, the grounds as above, some upon a good brisk red, or green or purple, or sad Cloth Colour, or Blew, and the greatest part upon white grounds. But be sure the Cha or the paint be the best can be done.

2,000 Pallampores of the ordinary Gulcondah sort of painting, 1½ yards broad and 2 yards long, that used to come for England.

5,000 Pallampores of the fine sort of Metchlepatam painting, the same breadths and lengths.

2,000 Pallampores 3 yards broad and 3½ yards long of the [word illegible painting as mentioned above.[1]

SILKS

There is no mention in the Coromandel records of silk exports in the seventeenth century, and from this it must be assumed that the well-known Madras silk-weaving industry of the nineteenth century was of recent origin. This is consistent with later observations that Madras silk-weavers spoke Gujarati among themselves and had therefore probably not been long settled in the South.[2]

EMBROIDERIES

Even more surprising is the absence of any reference in the records to embroidery exports, in spite of the fact that the Coromandel Coast is commonly given as

[1] I. O. Archives, Letter Book IX, 313-314.

[2] The Calico Museum of Textiles has a few samples of brocaded silk acquired from descendants of the Clive family and believed to have been brought to England by the second Lord Clive when he relinquished the Governorship of Madras in 1804. They are almost identical in pattern with well-known types of Gujarati silk-brocade.

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the provenance of some of the finest surviving embroidered "Tree-of-Life" hangings and bedspreads of the period.[1] It is difficult not to believe that if such an important branch of the Company's trade with Europe had flourished on the Coromandel Coast there would have been some references to it in the very detailed factory records. The only possible conclusion therefore is that the traditional attribution of these embroideries to the South is incorrect, and that they are probably of Gujarati origin. This is consistent, both in style and execution, with established examples of seventeenth-century Gujarati embroideries which have come to light in recent years.[2]

PLAIN AND DYED COTTON CLOTH

On the Coast, as in Western India, plain and dyed cotton piece-goods made up the bulk of textile exports. They varied widely in quality and will be classified here, as in the previous article, into three categories: (1) plain white cloth, (2) dyed cloth, and (3) cloth patterned in the loom.

(1) *Plain white cloth.* This included fine-quality muslin, which was traded under the generic term 'Betilles', from Portuguese *beatilla*, 'veiling'. It was woven mainly in Golconda (especially in the region of Warangal, which gave rise to the term 'Oringal muslin' in London), and was marketed all over Asia as well as in Europe.

Even more costly than the finest Coromandel muslin were the best or 'superfine' grades of plain white cloth known as 'Longcloth'. Longcloth, as the name suggests, was a category denoting only exceptional length (about 37 yards), the actual quality of weaving varying between very wide margins. From general experience on the Coast in the first half of the century it was found difficult to buy cloth more than about 16 yards long, which was short by comparison with standard lengths for linen-weaving in Europe. The European traders therefore did all they could to encourage the production of Longcloth in their efforts to compete with the linen trade.

Next to Longcloth were 'Salempores', usually about 16 yards in length and varying as much in quality and price. Shorter still were two other standard categories of plain woven cloth, known as 'Morees' and 'Percallas', neither exceeding 10 yards.

In the first half of the seventeenth century, all these types of plain woven cloth came chiefly from Golconda—especially the coastal belt stretching from Masulipatam in the south to Vizagapatam in the north. By the end of the century, however, production was centred mainly along the coast of Madras proper.

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[1] Typical examples are the two reproduced in *The art of India and Pakistan* (ed. Sir Leigh Ashton), London, 1950, plates 70 and 71.

[2] See my article, *Commercial embroidery of Gujarat in the 17th century*, Journal of Indian Society of Oriental Art, Calcutta, vol. XVII, 1949 (issued 1953).

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A rough indication of the relative purchase prices of these cloths in India can be derived from the following figures abstracted from a document dated 1724 :[1]

Trade name	*Dimensions*	*Price per 1,000 pieces*	*Price per sq. yd.*
Longcloth Superfine	37 x 1 yds.	£4,000	2*s.* 2*d.*
Longcloth Fine	37 x 1 yds.	£1,275	10*d.*
Longcloth	37 x 1 yds.	£707	5*d.*
Betilles (Pulicat)	20 x 1½ yds.	£2,250	1*s.* 9*d.*
Betilles (Warangal)	20 x 1½ yds.	£1,350	11*d.*
Betilles	20 x 1½ yds.	£833	6*d.*
Salempores Superfine	16 x 1 yds.	£1,000	1*s.* 3*d.*
Salempores Fine	16 x 1 yds.	£633	9*d.*
Salempores Ordinary	16 x 1 yds.	£343	5*d.*
Morees Fine	10 yds. x 1 yd. 8 in.	£750	9*d.*
Morees Ordinary	10 yds. x 1 yd. 8 in.	£437	6*d.*

(2) *Dyed cotton cloth.* Dyed cotton piece-goods played an especially important part in the spice-trade and included striped and checked patterns as well as plain. They were usually made up from the cheaper grades of Salempore or Moree and exported under such names as 'Allejaes', 'Callaway poose', 'Chelas', 'Chillies', 'Goaconcherulas' and 'Salalus', all of which are discussed in the Appendix. None of these goods played a very important part in European trade, which is one reason why comparatively little is known about their exact appearance.

(3) *Cotton cloth patterned in the loom.* Most important among these were 'Ginghams', striped cloths woven with double-threaded warps and wefts and therefore especially noted for toughness of texture. It is not certain whether Coromandel Ginghams were (like their Bengal counterparts) woven with mixed-cotton-and-Tussur-silk, or cotton throughout.

Another important loom-patterned cloth was known as 'Sacerguntes' or 'Sauruncheras', described as "dyed in the thread before making" (i.e. made according to the well-known Patola technique of tie-dyeing before weaving). The local provenance of these cloths is difficult to establish from the records; but it is not improbable that they came from the same area as the modern *telia rumals* of Hyderabad State.[2]

PILE CARPETS

Seventeenth-century Indian carpet-weaving has hitherto been associated exclusively with Mughal patronage in the North—especially at Lahore and Agra.

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[1] I. O. Archives, Letter Book XIX, 343-5.

[2] See Pupul Jayakar, *A neglected group of Indian Ikat fabrics*, Journal of Indian Textile History, no. 1, 1955, pp. 55-59.

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It is not generally known that there was also a flourishing carpet industry worked by Persian immigrants and their descendants in Golconda.

This southern industry was centred at Ellore and first became known to the English Company in 1679 as a result of a visit made to that town by Streynsham Master, then chief agent on the Coast, who records in his diary :

" We set forward early in the night, and by 9 or 10 in the morning came to Elloor. . . . This Elloor is reckoned one of the greatest Townes in the Country, that the King in his last progress came to see it, where are made the best Carpetts after the manner of those in Persia, by a race of Persians which they told us came over above 100 years ago. The manner of making them we saw, and as in brief thus, the Loom is stretched right up and down made of Cotton threads and the Carpet wrought upon them with the woollen yarn of several colours by young boys of 8 to 12 years old, a man with the pattern of the work drawn upon paper standing at the back side of the carpet, and directing the boys that work it, how much of each colour of yarn should be wrought in, and every thread being wrought they share it with a pair of Sizers (scissors) and then proceed to the next."[1]

When this report reached the London Directors they were at once anxious that the carpets should be given a trial and wrote back to India : " In your Consultation Book . . . we take notice that at Elloor, a town which our late Agent went through, there are made a sort of Persian Carpete, which although we have cause to doubt they will not make a gainful commodity here, yet being willing to try all experiments for the enlargement of our trade, we would have you send us 100 Carpets in all, whereof some of the Better sorte 2 yards wide, and 3 to 4½ yards in length : some about 3 yards long and 2½ broad; some about 2½ yards long and 2 yards broad, and some about 2 yards long and 1½ yards broad."[2] But that is the last we hear on the subject, and it has not even been ascertained whether the carpets actually reached London. In any case, it is unlikely that they were well received, for in 1686 we find the London Directors writing to their factors in Persia that " rich carpets are now grown much out of use in Europe " and that they are henceforth to be regarded as a dead commodity.[3]

So far it has not been possible to identify among seventeenth-century Indian pile-carpets any which can be said with certainty to have been woven in Golconda, although it might be claimed that the well-known Warangal carpets of the nineteenth century represent a survival of this local tradition.

LINEN

When the word ' linen ' appears in seventeenth-century East India Company records it can usually—but not invariably—be interpreted in the sense of *cotton*,

1 *Records of Fort St. George : Diary and Consultation Book*, 1679-80, Madras, 1912, p. 100.

2 Letter dated 5/1/1681, India Office Archives, Letter Book VI, 256.

3 India Office Archives, Letter Book VIII, f.180.

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for it was often used at this period in the vague sense of *any* plain white cloth made of vegetable, as opposed to animal, fibre. The exceptions, however, are important because they concern experiments which were in fact made on the Coromandel Coast in the 1680s to grow flax for linen.

The popularity of Indian cotton cloth in Europe was due, not to any general preference for cotton as such, but to the fact that it was substantially cheaper than home-made linen cloth, owing to lower labour costs. As it happened, there was always some prejudice against cotton in spite of its cheapness, and it was this which led the London Directors to the idea of encouraging a linen industry on the Coromandel Coast.

The idea was first advanced in a letter from London to Madras dated 10th March, 1681 : " We desire you to set your witts on work to cause some attempts to be made with your Agency for the production of flaxen or hempen cloth of any kind of good yarne of either sorts, 6 or 8 bales send us for tryall."[1] The reply must at first have been favourable, for two years later the London Directors expressed appreciation of what had already been done : " We are very glad to hear there is Flax and Hemp at Madapollam and would have you pursue the making of Flaxen cloth of all sorts as a great and National Interest of England and if you could make some as fine as the finest Holland (cloth) it must certainly turne well to account. . . . "[2]

There is no indication in the records that these trials were successful, and after 1683 nothing more is heard about them. By this time England was ready to buy at profitable rates all the cotton cloth that the Company could import, and there must therefore have seemed less reason to encourage linen production as an alternative.

SUMMARY

In the early seventeenth century, English and Dutch activities on the Coromandel Coast were entirely subservient to the needs of the spice trade in the Malay Archipelago, where Indian piece-goods were the standard article of barter for all nations. The factories established on the Coast were at this time administered from headquarters in Java and were independent of the trading activities simultaneously conducted by the Dutch and English Companies in the Mughal dominions with headquarters at Surat. It was not until 1649 that any English vessel sailed direct to Europe from the Coromandel Coast.

The piece-goods in demand for the spice trade were mostly the cheaper and coarser grades of cotton cloth, both plain and painted.

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[1] India Office Archives, Letter Book VI, 477.

[2] *Ibid*, Letter Book VII, 173. Before this, the London Directors had apparently received discouraging news and had given up hope of receiving linen cloth from India : " Some have told us that your people cannot weave linnen cloth, because the heat of the country by the working of the Loomes (*sic*) will sett their Webb on fire. If that be so, you may however provide linnen yarn of severall sorts and degrees of finest and coarsest, it would much help to fill up our ships and set off our Weavers on worke here, and may in time prove a beneficiall commodity . . . " Letter Book VII, p. 6.

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The Gujarat famine of 1630-32, which interrupted the already established flow of cotton goods from that part of India to Europe, caused the English and Dutch Companies to consider seriously the suitability of Coromandel piece-goods for the Western market. However, the Coromandel suffered her own, equally severe, famine in 1646 which interfered with these plans, and it was not until the 1660s that Coromandel piece-goods were sent to Europe on any substantial scale. Henceforth demand increased rapidly, reaching its peak in the last quarter of the century, when Indian cotton-paintings in particular revolutionised European fashions. This development coincided with the political and economic disintegration of Golconda, consequent upon wars and bad administration. As a result foreign traders encouraged the gradual transfer of a large part of the weaving and cotton-painting industry from Golconda to the coastal belt of Madras proper.

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CHAPTER III

North-East India

THE term ' Bengal ' is used here in its contemporary sense to denote not only the territories today known as East and West Bengal but also the adjacent states of Bihar and Orissa, which were at that time administered jointly under one Nawab.

At the beginning of the seventeenth century, approach to Bengal by sea was made difficult for the English by the presence of Portuguese forces at the coastal ports. Instead they concentrated on the overland route via Agra and Patna, using Surat as their base. This remained the main channel of English trade with Bengal until 1633, when a general decline in Portuguese power (culminating in the capture of Hughli by Mughal forces in the previous year) encouraged an approach to be made by sea from Masulipatam. This was further encouraged by the prevalance of famine conditions on the Coromandel Coast and a correspondingly urgent demand for new sources for the supply of piece-goods then needed in the barter trade for spices.

The English chose for their first settlements the area between Cuttack and Balasore in Orissa. But progress in the development of the English Company's trade there was slow, mainly, it seems, on account of bad management and the fact that those in charge were more than usually preoccupied with private trade. However, with the opening of an English factory at Hughli in 1651, prospects improved. " These places of Bengala and Eurixa [Orissa]," wrote the factors to London, " sufficiently manifest that there is room enough for the employment of a very great stock; where, although the Dutch invest at least £200,000 yearly, and some years find lading for seven of eight ships of burthen, nevertheless Your Worships, supplying this place with stock sufficient, and honest men to manage it, will soon find a great business and as much profit; when, besides for the shipping Your Worships shall design to return for Europe there may be sufficient to employ to Persia, the Red Sea, Achin, Pegu, Tenasserim, and Ceylon, places which all of them return good profit from, and are all of them within the monsoon of this."[1] In 1568 factories were opened at Kasimbazar and Patna, and ten years later at Dacca.

By the 1670s, the barter trade of the Malayan archipelago had ceased to be the main concern of the English factors in Bengal. Instead they were concentrating increasingly on supplies for the European market. This trend was accelerated by a general change of costume fashions in Britain, which was marked by an abandonment of the traditional home-made woollen stuffs in favour of silks and finery. Bengal silks did not usually compare in quality with the French and Italian silks which were the pride of the gentry in Europe, but they had the advantage of being

[1] *English factories in India*, 1651-54, ed. by W. Foster, Oxford, 1915, p. 304.

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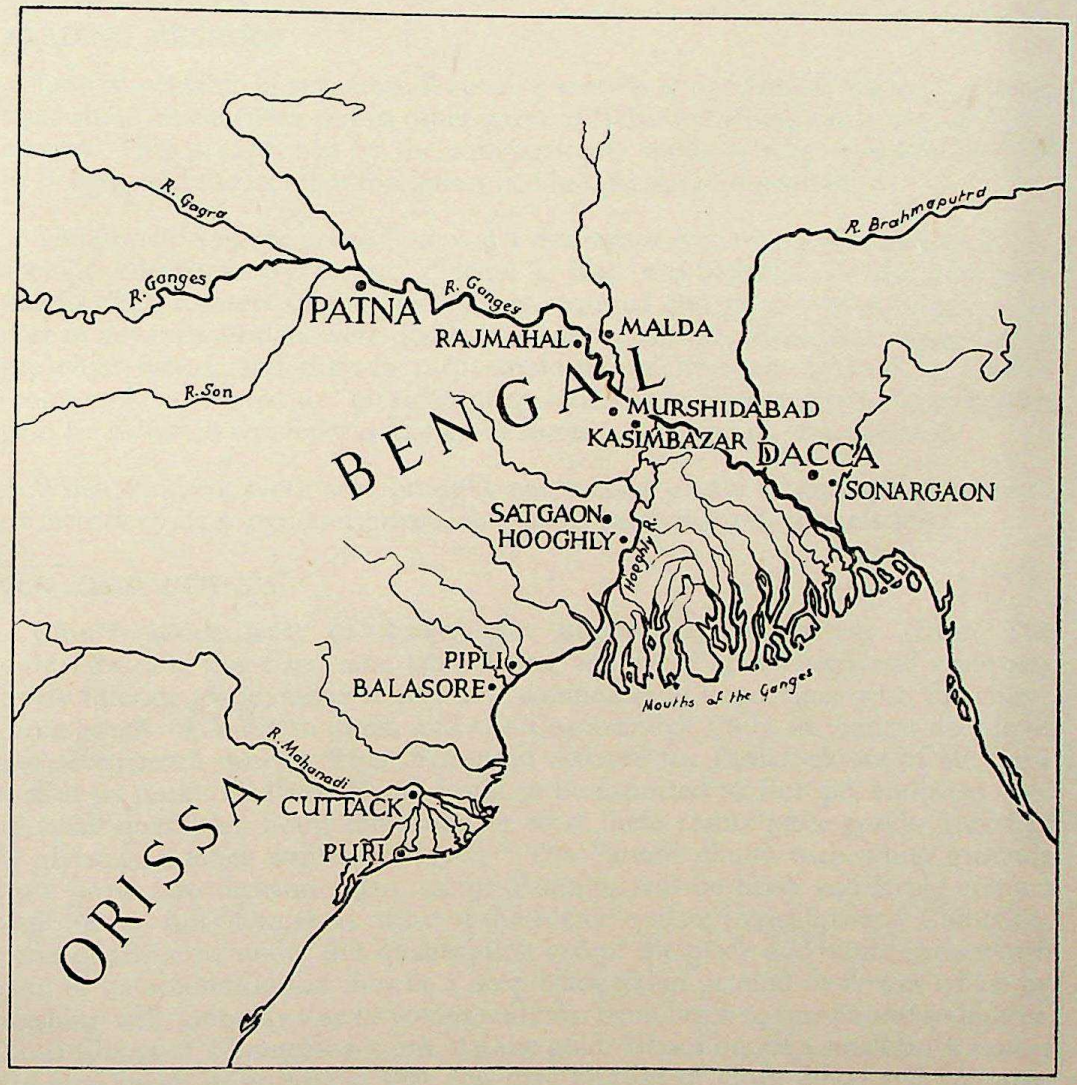

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very much cheaper and therefore available to a larger section of the population than would otherwise have worn silks. Fine muslin was also coming increasingly into use for both male and female dress and by the last quarter of the century there was a substantial demand for plain cotton cloth for the printing manufacturies now growing up everywhere in Europe and producing chintz in competition with India.

TRADING METHODS

Less is available in seventeenth-century records about Bengal trading methods than about those employed in other parts of India and discussed in the previous articles. This is explained by the comparatively stable trading relations enjoyed in Bengal, and the fact that foreigners had less reason to improvise.

The principal figure in the Company's dealings was the broker or *dallal* (usually spelt in contemporary records, 'dellol'), who was supplied by the European factors with musters of the piece-goods required and paid a proportion of the cost in advance. Orders were divided between a number of brokers approved by the chief factor, and they in turn employed intermediate brokers or *paikars* (commonly corrupted to 'picar') to negotiate direct with weavers. The advance paid by *paikar* to weaver was known as *barhni* (corrupted to 'burgunny').

When finished, cloth was brought unbleached to the Company's warehouse or factory to be sorted and priced, the *paikar* receiving 2% commission.[1]

COTTON-PAINTINGS

Chintz goods were of insignificant importance in Bengal trade. The only fabrics in this class came from Patna and were of a cheap and comparatively inferior grade, never at any time competing in importance with the chintz piece-goods of Western India and the Coromandel. Only in the last decade of the seventeenth century when European demand for Indian chintz of all kinds was at its peak, did Patna chintz begin to be exported to Europe, and then only in small quantities. Some indication of what these chintz piece-goods were like is given in a letter written in 1700: "The Pattana chints with white grounds now grow into demand again, as the Painting will be brisk and lively colours and not too full of work as many of the Metchlepatam [Masulipatam] Chints be. Send of any sorts under this qualification except the black and white sorts which turn to no account unless they be a deep black either ground or flower which by washing will not easily lose its colour and turn from black to brown and so lighter. Your Chints of a branching-work like the gold Atlases but of a small brisk flower are now much in vogue, so that you may buy up of cloth white and coloured grounds as you can light of them, especially of the branch and trailwork."[2]

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[1] Memorandum on *Method of buying cloth at Dacca*, 1676, I. O. Archives, Factory Records Miscellaneous, vol. 26. I have not been able to discover the commission paid to *dallals* at this period. There are, however, indications of corrupt practices between *dallals* and European factors, the latter sometimes being willing to accept bribes for favoured contracts.

[2] I. O. Archives, Letter Book X, p. 376.

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SILK GOODS

Both raw silk and finished silk piece-goods comprised an important part of Bengal's export trade in the seventeenth century, and from about 1670 onwards the English Company was one of the largest buyers.

As earlier explained, Europe welcomed Bengal silk goods for their cheapness rather than for quality. In 1665 the French traveller Bernier wrote: "The silks [of Bengal] are certainly not so fine as those of Persia, Syria, Saida and Beirut, but they are of a much lower price; and I know from indisputable authority that, if they were well selected and wrought with care, they might be manufactured into most beautiful stuffs."[1] The English Company, too, recognised the need for selection and supervision in the preparation of the silks if they were to sell well in Europe, and accordingly they sent out experienced English dyers, weavers and throwsters to do this. In 1668 a dyer named Roger Fowler was sent out at a salary of £60 a year, and the factors of Kasimbazar were instructed "to treat him civilly . . . he being an ancient person, and one who hath lived in good repute in London till it pleased God to make him a sufferer in the late dreadful fire."[2] By 1660 it was said that the Kasimbazar factory "keepeth many tradesmen at work here by order of the Company, as Dyers, Weavers, Throwsters, etc., being Englishmen sent on purpose for the ordering their silks after the English custom, and for dyeing a good black, a colour the natives could never dye well . . . "[3] (Not all the dyers and throwsters were sent direct from London, some of them had come to India as soldiers, and having had experience in the silk industry before enlisting were allowed to change their occupations). However, these measures were not on the whole successful. More often than not, conservatism triumphed, and by 1689 all the English dyers—and probably also the throwsters and weavers—had been withdrawn.

Bengal silk fabrics were known to the English by the term 'taffeta' or 'taffatie.' This word was current in medieval Europe in a rather vague sense to imply fine fabrics, usually of a silky or glossy quality (Shakespeare had written of "taffeta phrases, silken tearmes precise"). When introduced into India by Europeans, it became mixed up with Persian *tafta*, 'a glossy twist,' already in use as a term for silks.

The main use for Bengal silks in Europe was for petticoats and linings. In 1682 the London Directors instructed the Bengal factors "to push on the making of Taffaties to your utmost quantities procurable, for that is always a sure staple commodity, and he can never send us too many of them. All sorts of Cloth colours do well and a ship's loading of Blacks if it were possible to have them well dyed in the silk would hardly clog Europe, so great is the vent of that Commodity for lyning all sorts of Garments for Men and Women."[4] And again: "Of all silk wares take it for certain rule, that whatever is new gawdy or unusual will always find a good price at our Candle."[5]

[1] F. Bernier, *Travels*, trans. by A. Constable, London, 1891, pp. 439-40.
[2] I. O. Archives, Letter Book IV, p. 202.
[3] Thomas Bowrey, *Countries round the Bay of Bengal*, Hak. Soc., London, 1903, pp. 214-15.
[4] I. O. Archives, Letter Book VII, p. 60.
[5] *Records of Fort St. George: Despatches from England*, 1681-86, Madras, 1916, p. 83.

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Most Bengal ' taffaties ' came from the area round Kasimbazar and Malda. Many were not pure silk goods but of mixed cotton and silk, usually striped. In the Glossary at the end they will be found under such names as ' alachas ', ' seersuckers', ' sousacs', ' tuckeryes,' 'mundeels,' ' mandillas', ' nehallewars', ' cherconnees', etc.

Besides those made in the Malda-Kasimbazar area of ordinary silk (*bombyx mori*), Bengal also produced in an area further south (especially in the region of the Bengal-Orissa border) fabrics of mixed Tussur-silk and cotton commonly known at the time as ' herba goods '[1]. Those most in demand for the European market were known as ' ginghams ' and ' nillaes'.

In addition to Tussur goods, there were some woven with another species of wild silk known as ' arundi,' which is probably to be identified with *muga*, the wild silk of Assam (*Antheraea assama*)[2]. Muga silks were also much used for embroidering muslin piece-goods.

Apart from silk fabrics, substantial quantities of raw silk (mostly *Bombyx mori*) were also shipped.

EMBROIDERIES

There were two kinds of embroidery which featured prominently among Bengal exports of the seventeenth century. The first consisted mostly of quilted bedspreads worked with pictorial designs in yellow Tussur silk, made in the Hughli area under Portuguese influence the second were embroidered muslin piece-goods from Dacca.

The first group was particularly important and interesting from an æsthetic and historical point of view. Specimens identified in European museum collections were first discussed in a paper I wrote several years ago[3], and here I will limit myself to a summary of the information.

Embroideries in this group owed their existence initially to Portuguese patronage and comprised an important article of export to Europe between about 1550 and 1650, when they ceased to be made. Two outstanding characteristics are, first, that the monochrome silk used for the embroidery is invariably yellow, and, secondly, that the needlework covers almost every square inch of the ground. Designs are of the pictorial type, usually incorporating hunting scenes with European figures; ships and underwater scenes with fishes, mermaids, etc.; and illustrations either of Old Testament stories, or legends from the

[1] Tussur is one of the wild silks, derived from the silkworm *Antherea paphia*. It was erroneously thought by early European traders in India to have been " spun from a herb " : hence the synonym ' herba ' which persisted in general use long after the real nature of Tussur was understood. I have discussed this matter in more detail in my paper *Indo-Portuguese embroideries of Bengal*, Art and Letters : Journal of Royal India and Pakistan Society, vol. 26, no. 2, 1952.

[2] The *eranda* or *arand* plant (*Ricinus communis*, otherwise known as the castor-oil plant) was food for the *muga* silk worm.

[3] John Irwin, *Indo-Portuguese embroideries of Bengal*, Art and Letters : Journal of Royal India and Pakistan Society, vol. 26, no. 2, 1952.

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Græco-Roman classical repertoire. The designs are interspersed throughout with birds, animals, flowers, and decorative motives borrowed from both Indian and European tradition. The motives of European origin are mostly of conventional Renaissance style, sometimes copied faithfully, but more commonly Indianized to an extent that renders them only vaguely recognizable as European. Besides features of Italianate Renaissance origin, the designs include details borrowed from sixteenth-century Spanish and Portuguese art. Examples of these are the double-headed eagle, conventional representations of the sun and moon, and armorial casque-and-scrollwork. The Indian elements in the designs are no less conspicuous and commonly betray association with the iconography of the Vaishnava cult. For instance, recurring scenes with a ship manned by Portuguese sailors, surrounded by fishes and various marine monsters, are clearly derived from conventional Vaishnava representations of the Great Flood, in which Vishnu, in his Matsya or fish incarnation, is depicted guiding Manu's ark.

As far as technique is concerned, the quilts are worked in chain-stitch on a coarse cotton (or jute) ground, the actual quilting being in back-stitch.

" Bengalla quilts," as they were called, were already famed in Europe when the English began trading in India. It is not surprising therefore, that they were sought by the English factors from the time of their arrival. The earliest reference to their sale in London appears in the account of an auction held on 25th February, 1618 : " Then was put to sale a Bengalla quilt of $3\frac{1}{4}$ yards long and 3 yards broad to be paid for in ready money, embroydered all over with pictures of men and crafts in yellow silk, Mr. Henry Garway bidding £20 for it[1]". In the following year, the Company's Council at Surat instructed the Agra factors to supply more quilts " stitched with birds, beasts, or work very thick, such as used by the Moors instead of carpets. Of this sort there comes, it seems, from Bengalla."[2]

In 1620, when the first English factory at Patna was established, the senior factor reported : " I shall here provide some quilts of Sutgonge (Satgaon, the old mercantile capital of Bengal, 23 miles north of modern Calcutta) wrought with yellow silk, at reasonable rates; and have already half a score in possession, and am promised more daily as they come to town."[3]

This quotation suggests that Satgaon or its neighbourhood was the region of manufacture, which is supported by the evidence of Vaishnava iconography and many parallels between the pictorial style of the quilts and the relief terracottas which embellish many West Bengal temples of the same period. In any case, it is clear that the quilts owed their existence to Portuguese patronage in the first place, and this perhaps explains why little is heard of them after the sack of Hughli in 1632. It is safe to infer that by the middle of the century they had ceased to play any important part in Bengal's export trade.

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1 I. O. Archives, Court Book IV, f. 135.

2 British Museum, Egerton Ms. 2122, f. 64.

3 I. O. Archives, Patna Factory Records, vol. I, f. 3.

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The piece-good embroideries of Dacca were an entirely different class of work stemming from Islamic rather than Hindu tradition. The ground was always plain muslin, and the needlework of two kinds : either coloured silk embroidery in chain-stitch, or what contemporary records describe as " white embroidery", probably corresponding to what later came to be known as Dacca *chikan* embroidery (cotton worked on cotton).[1] Besides piece-good material, there was also some demand for ready-made embroidered ' shifts ' (a kind of chemise worn by women). Thus, in 1682, we find an order conveyed via Fort St. George for 200,000 " Callicoe shifts . . . some fine enough for Ladies and Gentlewomen ; if some be wrought on the breasts, and on the sleeves, and in the collar with needlework, the price here will sufficiently pay for the worke, and cost there, where labour and art are so cheap ; take especial care that the sowing be very good and all the cloth strong in its kind, as well fine as coarse."[2] The absence of any local tradition for such embroidery on the Coromandel Coast would almost certainly mean that such orders were forwarded to the factors at Dacca.

The embroidered piece-goods were mostly worked on the finer grades of muslin such as ' mulmulls ', ' tanjeebs ' or ' cossaes ' and were required in Europe for making into gowns, aprons or petticoats. The latter were perhaps the commonest use at the turn of the century, when the fashion of looping back the upper skirt became general, thus giving special emphasis to the petticoat which was commonly of a material contrasting with the skirt.

PLAIN COTTON CLOTH

Plain muslin goods comprised perhaps the largest bulk export. The very finest and most expensive Dacca muslins, famous since Roman times, were not in demand by the English East India Company, partly because the limited supply was monopolised by native merchants for use at the Indian courts, and partly perhaps because of the unsuitability of such material for the West European climate. The most expensive muslins bought by the English did not normally exceed Rs. 50 per piece (about 21 x 1 yards), whereas the very finest grades made in the reign of Jahangir were said to have cost Rs. 400 per piece.[3]

About twenty different kinds of muslin are mentioned among the English Company's exports, most of them woven in the Dacca area, but some of them also obtainable in West Bengal. According to maximum prices paid, the main sorts could be classified in the following order of fineness : ' tanjeebs ', ' mulmulls ', ' nansooks ', ' terrindams ', ' aliballies ', ' seerhaudconnaes ', ' addaties ',

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1 For instance, orders for the year 1681 included " 500 Mulmulls with fine needlework flowers wrought with white, the flowers to be about 3 or 4 inches asunder and neat . . . " I. O. Archives, Letter Book VI, p. 266. The same order was repeated later (*vide* Letter Book VII, pp. 23-4). *Chikan* embroidery of Dacca was described by James Taylor in his anonymous work, *Descriptive and historical account of the cotton manufactures of Dacca*, 1851, pp. 103-7.

2 *Records of Fort St. George : Despatches from England*, 1681-86, Madras, 1916, p. 15.

3 According to verbal tradition recorded by James Taylor, *Sketch of the topography and statistics of Dacca*, 1851, p. 172.

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' humhums ', ' sannoes ', ' cossaes ', ' chowtars ', ' gurras '. However, there was considerable variation of fineness under any one name, and any shipment might include ' tanjeebs ', for instance, at both Rs. 50 and Rs. 10 per piece.

SUMMARY

In the first half of the seventeenth century, the English East India Company played a comparatively small part in Bengal trade. With the Restoration of the monarchy in England (1660) and the spread of the fashion for wearing silks and fine muslin, the demand for Bengal textiles increased rapidly, reaching its peak in the 1690s. During this period the three main areas of supply were : (1) Malda-Kasimbazar, for fabrics woven with ordinary silk (mostly silk-and-cotton mixed); (2) Mayurbhanj-Midnapore, for fabrics of mixed Tussur-and-cotton and also plain cotton cloth; (3) Dacca District, for plain cotton-cloth and embroidered muslin piece-goods. Tussur-silk embroideries were a much-coveted commodity of Hughli region during the period of Portuguese supremacy there, but ceased to be made after the middle of the century. At the end of the century, there was some demand for the cheap and comparatively coarse cotton-paintings of Patna.

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CHAPTER IV

Foreign Influences

In previous chapters, the emphasis has been on what India exported to Europe, and little has so far been said about reciprocal influences received from Europe during the same period. Yet, from the point of view of the art historian (as distinct from the economic historian) the European contribution is important, especially for the light it throws on the very nature of Indo-European cultural exchange.

The success of East India Company trade did not depend simply on the carrying of textiles ready-made from India to Europe. It was a highly specialised trade for which goods had to be specially commissioned according to European needs, and this meant the adapation of Indian skills and techniques to alien standards of taste and fashion.

Europe was attracted to Indian decorative textiles on account of their cheapness and technical excellence (especially their fast and brilliant dye-colours), *not* their qualities of design. Hindu decorative tradition was strange and of little appeal to non-Hindus. Even the Mughals shared this response. The Emperor Babur (1526-1530) records in his memoirs a haughty contempt for all Indian arts and crafts,[1] and it was left to his successors—especially Akbar (1556-1605) and Jahangir (1605-1627)—to try to improve the situation to their liking by introducing foreign craftsmen to train Indians in new styles and techniques. Turks, Persians, Chinese and Italians were among those Akbar and Jahangir brought in; and at the same time court craftsmen were sent to the Portuguese settlements to study and emulate whatever they could find there.[2] From these mixed influences there gradually emerged a distinctive—yet nonetheless Indian—tradition of Mughal art.

When the Dutch and English reached India, Mughal art was still a sheltered court convention, and they too responded unfavourably to Hindu art conventions. Their disappointment with what they found was all the more acutely felt on account of a false expectation that Indian arts and crafts would be like those of China, already well known to them through the 'China shops' of London and other European capitals. As yet, vague geographical notions of what actually constituted the 'East Indies' left them unaware that India and China had different and hardly related art traditions. This attitude was clearly reflected in the letters and diaries of Sir Thomas Roe, English ambassador to the Mughal court

1 *Memoirs of Babur*, trans. A. S. Beveridge, London, 1922, vol. II, p. 518.

2 *Āīn-i-Akbari*, trans. H. S. Jarrett, Calcutta, 1894, vol. III, pp. 207 and 322; *Tuzuk-i-Jahangiri*, trans. A. Rogers, London, 1909, vol. I, p. 215.

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between 1615 and 1619, as when he wrote: "I thought all India a China shop, and that I should furnish all my friends with rarities; but this is not that part. Here are almost no Civil Arts, but such as the straggling Christians have lately taught."[1] And again: "Here are none of the rarities of India [East Indies]: they all come from the Eastern part [China], and are as dear as in England."[2]

However, the situation for Roe and his contemporaries was not without hope from their point of view, for they soon discovered that the Hindu craftsman was a willing and imaginative copyist, ready to adapt his decorative style in any way required. On this discovery was also founded the East India Company's policy of commissioning textiles appropriate to European taste and fashion.

In the first two or three decades of the century, Indian chintzes and embroideries had been welcomed in Europe only as curiosities and in very small quantities. As late as 1643 the Company was asking for only 60 to 100 quilts a year, with the explanation that "they serve more to content and pleasure our friends than for any profit that ariseth in sales, your first cost, freight and custom being put together."[3] At the same time it occurred to them that if patterns and designs could be modified to conform more closely to English taste, sales might become larger and more profitable. Accordingly they instructed their factors in India that "those which hereafter you shall send we desire may be with more white ground and the flowers and branch to be in colours in the middle of the quilt as the painter pleases, whereas now most part of your quilts come with sad red grounds which are not so well accepted here . . . ". The significance of these directions become apparent when we recall the traditional Indian cotton-painter's preference for a pattern reserved against a coloured ground, now to be reversed in favour of a pattern in silhouette against a white ground.

The results of this policy eventually proved successful, and in 1662 the Directors were encouraged to go a step further by sending out actual sample-patterns as models for Indian cotton-painters to copy or adapt: "We now send you herewith enclosed several patterns of Chints for your directions, and desire you to cause a considerable quantity to be made of those Workes."[4] In 1669, similar instructions were followed by a revealing passage: "Now of late, they are here in England come to a great practize of printing large branches for hangings of Romes, and we do believe that some of our Callicoes printed after that manner might vent well, and therefore have sent you some patterns, of which sort we would have you send us 2,000 pieces . . . "[5]

This latter quotation is of special significance, because hitherto Western art historians have assumed that the "large branches for hangings" which characterize both English embroidery and Indian chintzes of the period originated as

1 From a letter to the Earl of Southampton, *Embassy of Sir Thomas Roe*, London (Hak. Soc.), vol. I, 1899, p. 134.

2 *Letters received by the E. I. C.*, vol. VI, London, 1917, p. 299.

3 India Office Archives, Factory Records Miscellaneous, vol. XII, folio 99.

4 India Office Archives, Letter Book III, p. 161.

5 *Ibid*, IV, p. 326.

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India's gift to Europe. The facts are, however, that the style *originated* in Europe but was much modified in Indian hands, so that when the Indianized versions reached Europe they were welcomed as something new and exotic.

Unfortunately none of the original sample-patterns or "musters" sent to India now survives, and we can therefore only speculate on the form they took. For the early eighteenth century, we have definite evidence that cotton-painters were copying or adapting designs from contemporary English floral engravings, and in at least one instance it has been possible to trace the original floral engravings from which a particular chintz design was adapted.[1] Whether this practice was started in the seventeenth century is more difficult to prove, because fewer of the early chintzes have been preserved. It is certainly possible that floral engravings were being sent out from about 1660 onwards, when this type of illustration (after its first appearance in Holland in connection with Dutch horticulture) was becoming popular and fashionable in the hands of such artists as Jean Babtiste Monnoyer.

Another form of sample-pattern probably in use in India was the type of pattern-book in common use among European embroiderers and lace-makers, many of them originating in Italy or copied from Italian sources. These were printed black-and-white line drawings, seldom larger than half-foolscap.

With the development of direct trade with China from about 1675 onwards, and the resultant stimulus given to Chinese fashions in England, it is not surprising that the sample-patterns sent to India at this period should have incorporated many elements of 'chinoiserie.' Indian cotton-painters supplying the Persian market were independently influenced by elements of Chinese origin in Persian art, and this influence re-emerges in the palampore designs depicting a flowering-tree growing with exposed roots from a conventional rockery. Prototypes are recognisable in Persian painting of the sixteenth century.

'Chinoiserie', which can be defined simply as a foreigner's exercise in the Chinese style or manner, had a complicated history in Indo-European art. In the late sixteenth century we find authentic Chinese works of art reaching England and starting a fashion. This in turn gave rise to English 'China worke' or *chinoiserie*—often no more than the weakest parody of Chinese convention—which then became a fashion in its own right. When exported in the form of sample-patterns from Europe to India, this European *chinoiserie*, already a parody of Chinese art, was further parodied to produce Indian *chinoiserie*, which also became a fashion in Europe in its own right. At the final stage we find Indian *chinoiserie* designs being sent from Madras to Canton for copying by Chinese embroiderers and silk-painters. By this time it was a convention so far removed from authentic Chinese art that Cantonese embroiderers were probably unaware of its Chinese origins at all.[2]

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1 K. B. Brett, *An English source of Indian chintz design*, Journal of Indian Textile History, no. 1, 1955, pp. 40-45.

2 I have discussed this subject in more detail in my article, *Origins of the 'Oriental Style' in English decorative art*, Burlington Magazine, London, vol. XCVII, 1955.

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Apart from the role of *chinoiserie* in Indo-European textiles, we can recognise some direct Chinese influence in Mughal art. This at once calls to mind the well-known series of relief panels carved in Chinese style at the Turkish Sultana's palace, Fathpur-Sikri. We also know of the keen demand for Chinese porcelain among Indian rulers and nobility. These influences, however, are independent of the even stronger influence of European *chinoiserie* which for more than a century dominated the designs of painted cottons commissioned for Europe.

EUROPEAN TEXTILES IN INDIA

Pattern-books or samples sent out by the East India Company were not the only means by which India came to be familiar with European textile design. There was also a luxury trade in European fabrics which had been reaching India from at least as early as the fifteenth century.

One striking piece of evidence for this is an eye-witness account of Vasco da Gama's historic voyage which describes how he first arrived at Calicut to find Italian brocades already on sale in the bazar.[1] European velvets are elsewhere mentioned as being sold at the Vijayanagar capital prior to its destruction in 1565.[2] In fact, there is abundant evidence to show that independently of Portuguese, Dutch and English influence, there flourished a regular trade in European luxury fabrics to India, starting from Venice and reaching the western seaports via Alexandria, Cairo, Jidda and Aden.[3]

The English East India Company was always willing to try any commodity likely to be acceptable in India in place of the bullion which its critics tried to stop being exported. It has already been explained that English broadcloth was one of these commodities ; another was Flemmish and English tapestry.

Tapestries are first mentioned in the records in 1614, as suitable gifts to Indians of influence.[4] Further weight was lent to this suggestion in 1616, when a high official of Jahangir's court suggested to Sir Thomas Roe that " Arras hangings " would be very acceptable to the Emperor.[5] Roe forwarded the advice to London and it was promptly followed, so that a year later he was able to record in his diary that the hangings given to Jahangir had left him " wonderfully satisfied." Encouraged by this success, Roe then suggested that " Arras hangings " should be included among commodities to be traded in India, specifying that they must be of " fresh and good colours," and that " for one or two years they may vent to some profit for £10,000."[6] At the same time he recommended a personal gift of " some rich piece " of tapestry from King James I to Jahangir.

1 Sernigi, in Ramusio, 1554 edn., p. 1. 130b.

2 *The Book of Duarte Barbosa*, London (Hak. Soc.), 1918, vol. I, p. 203.

3 Federici, in *Hakluyt's Voyages*, vol. III, mentions Gujarat's imports of " Velvets of Vercini." For Calicut imports, see Barbosa, *op. cit.*, II, 77. Also, Thome Pires, *The suma oriental*, London (Hak. Soc.), 1944, for general references.

4 *Letters received by the E. I. C.*, vol. II, London, 1897, p. 108.

5 *Embassy of Sir Thomas Roe*, London (Hak. Soc.), vol. I, 1899, p. 352 fn. There were precedents of gifts of European tapestries to oriental rulers. According to Froissart, a set depicting the History of Alexander was sent as ransom to Sultan Bayezid I of Turkey. In the early fifteenth century, the King of Castile sent tapestries to Timur.

6 *Embassy of Sir Thomas Roe*, London (Hak. Soc.), vol. I, 1899, p. 244.

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However, the Company's factors in India were always sceptical of Roe's commercial advice, and from the beginning opposed the idea that such a trade would be profitable.[1] In this they proved correct, because although a large number of tapestries were sent out during the next fifteen years, the factors were compelled to devote an entirely disproportionate amount of time in trying to sell them; and even when sales were effected, it invariably took months—sometimes years—to extract money from the purchaser. As one factor put it, the nobility were " loath to lay out very much money upon a commodity that serveth them but once a year."[2]

The fact that the Company persisted in sending out tapestries in face of such discouragement must have been due in some measure to the influence in its councils of Sir Francis Crane, a director of the Mortlake tapestry works near London. Crane was also influential with the King and could not be ignored for that reason alone. When, finally, the Company decided to give up trading in tapestries at its own risk, an arrangement was made with Crane for selling them on commission. Thus, the minutes of a meeting held in 1629 record Crane's agreement with the Company's proposal that they should pay him 6s. 8d. per Spanish rial on sales in India.[3] The net profit expected was 100%.

Themes illustrated in the tapestries sent to India were usually classical. There are several references to one set illustrating the story of " Vulcan and Venus ". Another, depicting the " History of Hercules ", was brought back to England as unsaleable after being hawked round India for more than ten years.

After Crane's death in 1636, tapestries disappear from the records, the only exception being a reference to a set in 1652. This was probably a set left unsold since Crane's lifetime. " Such things ", reported the factors on this occasion, " are hardly put off here, especially when they have any imagery in them, as these have in the borders of angels and cherubins."

Although only of marginal interest, it is relevant in this context to record that there was a passing enthusiasm in Jahangir's court for English embroidery and costume. This was first mentioned in the records in connection with a request for hats to be sent from England : " . . . If you send half a dozen of coloured beaver hats, such as our gentlewomen use, they will be liked, for the King [Jahangir] demanded such things of me for his women to wear a-hunting ; and one or two rich hats for himself, white or some light colour, for his hunting journeys would be esteemed."[4] English embroidery was also particularly esteemed. In 1617 Sir Thomas Roe asked for embroidered coats, to be specially tailored in Indian

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1 British Museum, Egerton Ms. 2122, f. 1, et seq.

2 India Office Archives, Factory Records Surat, vol. 102, f. 125. This remark is an allusion to the fact that under conditions of Mughal rule, the nobility were constantly being moved about from one administrative assignment to another.

3 India Office Archives, O.C., vol. 7, no. 827.

4 Letter from Surat factors dated 1614. *Letters received by the E. I. C.*, vol. II, London, 1897, p. 108.

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fashion according to patterns sent.[1] Also, he wanted embroidered boxes, gloves, sword-hangers, scarfs and cushions—all of which were recommended both as gifts and as commodities to be traded in India.[2] In the same letter he advises the despatch of " some light coloured Norwich stuffs wrought in flowers for trial, the lighter the better. I am persuaded many would vent, if chosen fitly."

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1 *Embassy of Sir Thomas Roe*, London (Hak. Soc.), vol. 2, 1899, p. 485.

2 " Any of this in needlework or embroidery will sell cent per cent or not much less . . . " *Op. cit.*, vol. 2, p. 485.

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APPENDIX

A GLOSSARY OF TEXTILE TERMS

THIS glossary is condensed from a large volume of notes made while studying ms. records. It includes the names of most of the fabrics of Indo-European commerce in the seventeenth century, spelt in the corrupt forms in which they appear in English records. The system followed is broadly that of Yule and Burnell in their monumental *Hobson-Jobson*, except that I have quoted from unpublished as well as published sources (all included in the bibliography). A title in italics indicates a published source; and in Roman type, unpublished.

Since few European merchants in the seventeenth century applied themselves to the study of Indian languages, the native words borrowed by them were invariably assimilated to English habits of spelling and pronunciation without any attempt to preserve alien shapes and sounds. This leads to many difficulties of identification, sometimes reducing the task to inspired guesswork. Philologists will no doubt be able to fill some of the gaps and also correct some mistakes. The main purpose has been to make a start on a basis more comprehensive and systematic than anything yet attempted, in the hope that others will build on it.

Since this glossary was first compiled and published I have revised a number of entries, and I should like in particular to acknowledge helpful suggestions from Smt. Gira Sarabhai, Dr. Moti Chandra, Mr. R. N. Mehta, Mr. Robert Skelton and Miss Margaret Hall.

ADATHAIES, ADDATIES. North-east India. Plain muslin, usually of fine quality. Woven chiefly in Dacca District.

1707. "Plain muslins . . . fine close struck cloth such as . . . *Addaties*."

Letter Book XIII, p. 105.

ADPUTTAES, UDPUTTAES. Western India. Hindi and Sanskrit *ardha patta*, 'half-silk'. A cloth of mixed cotton-and-silk woven in Sind, exported mainly to Persia. Not important.

ALACHA, ALLEGAIS, ELATCHES, LAYCHES, etc. Western India and Bengal. Turki *alcha*, *alacha*, 'stripes'. Originally a striped cloth of mixed cotton-and-silk, commonly red-and-white or blue-and-white, sometimes flowered and embellished with gold and silver thread. Gujarat *Alachas* usually contained a higher proportion of cotton than Bengal cloth of the same name which sometimes led to their being classified as calicoes. Bengal *Alachas* were chiefly woven in the Malda-Kasimbazar area and much in demand in Europe for petticoats. It is possible that the same word explains the *Allejaes* of the Coromandel coast which were similarly striped (probably in imitation of Gujarat and Bengal *Alachas*) but made entirely of cotton. Platts gives Hindi *ilāchā*, 'a kind of cloth woven of silk and thread so as to present the appearance of cardamons (*ilāchi*), but it is not certain that he is referring to the same product. According to Yusuf Ali (p. 95) *Alachas* differ from Doreas (s.v.) in being of more substantial texture. A sample from Agra can be seen in Forbes Watson, vol. XIV, no. 538.

1617. "*Alejas*, striped blue and white . . . "

Letters received, V, 63.

1682. "Silke *Allejahas*, usual breadth is ¾ yd. broad and 7 yds. long."

Letter Book VII, 31.

North-east India:

1632. "*ellachas* . . . a silke stripte stuffe, 16 coveds long . . . from Malda."

Mundy, *Travels*, II, 155.

1660. "They bought . . . Alachas or silken stuffs striped, some with gold and some with silver, for vests and summer trousers . . . "

Bernier, *Travels*, 139.

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1681. " . . . silk and cotton *Elatches* . . ."

Letter Book VI, 413.

1683. Ordered for London : " Silk *Elatches*, but let the stripes and flowers be brisk and lively and let them be made 14 yards long but none with blood-red stripes or very few. The stripes to run longways and not Cross, to make their own Fancie, only observe what colours suit and are not tawdry."

Letter Book VII, 153.

ALLIBALLIES. Bengal. Probably Arabic *ā'lā*, ' superior ', and Hindi *bhalā*, good. A very fine quality muslin (see Taylor, p. 45). Not to be confused with Allibannees (s.v.).

ALLIBANNEES. North-East India. Woven cloth of mixed silk-and-cotton, from the Malda-Kasimbazar area. Probably striped. Yule and Burnell (p. 706) derive the word from Arabic *ā'lā*' ' superior ', and Hindi *bānā*, ' woof '.

ALLEJAES, ALLEGAES. South India. This word is probably a regional corruption of ALACHA (s.v.), although the Coromandel *Allegaes* were apparently of cotton rather than cotton-and-silk. Like *Alachas*, they were mostly striped, either red-and-white or blue-and-white, but checkered *allejaes* are also mentioned. They do not appear in Coromandel trade before 1670, whence they were shipped to Europe as handkerchiefs. Chiefly made near Masulapatam.

1676. " For the *Allejaes*, you must take care that the red be a deep full red and the white a perfect white, we send you a pattern for your better direction . . . "

Letter Book V, 373.

1676. " *Allejaes*, 10,000 whereof 1,000 pieces to be of the small checker work in the handkerch now sent for a pattern and 1,000 pieces of the broad checkered work in the outward part of the handkerch."

Letter Book V, 378.

1678. " *Allejaes* . . . red stripes to be lively and full, the other stripes to be perfectly white."

Records of Fort St. George, Despatches from England, 1670-7, 135.

AMBERTEES. Bihar. A superior grade of white cloth woven in the Patna area. It was much in demand for the London market in the first quarter of the seventeenth century, but was only occasionally exported after the middle of the century. It was especially used for the lining of quilts, and also for re-export to North Africa.

1619. "The narrow cloth called *amberte callicoes* . . . is strong, close-made and well conditioned, and hath no fault but the narrowness ; and we doubt not will be very vendible, if not in England, yet to be transported for Barbary, being so like the Polonia [Polish] cloth usually sent thither."

English Factories in India, 1618-21, pp. 161/2.

1620. " The *amberty callicoes* are made a day's journey from this place [Patna] in a prigonye [Pargana] or shier called Lackhower [Lukhawar], where they are to be bought of all prices, infinite quantities, from the poor weavers which make them, brown, whereof there are three sorts : the first narrow breadths, and are commonly called *rasseyes*, generally coarse and few or none above 2 rupees net the piece of about ½ yard broad and 13 yards long ; the next sort are called *zefferconyes*, and at most may be one-fourth broader than the former, but much finer and of higher prices, from 2 to 6 rupees the piece ; and the third and last sort, the broadest and finest, known here by the name *Jehangeres*, whereof some a full English yard and few or none above . . ."

English Factories in India, 1618-21, p. 213.

ARDEAS. Western India. Possibly from Gujarati *aradhi*, *adadhi*, ' half ', the latter also meaning ' pie '. Plain dyed cloth of Gujarat and Rajputana, usually dyed to order from white cloth such as

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guzzees (s.v.) or *eckbaries* (s.v.) Exported to the Near East and Malay Archipelago, but not often mentioned after 1650.

ARUNDI, ARUNDEE. North-East India. A coarse, cheap and exceedingly strong cloth woven with one of the wild silks of Bengal. (See under *Muga* and *Tussur*.) The name derives from the *arundi* plant on which the particular silkworms fed. It was exported to England in small quantities, either brown or blue, in the last three decades of the century. Sometimes used as sailcloth.

1679. "*Arundee* . . . made neither of Cotton nor Silke, but of a kind of Herba spun by a worme that feed upon the leaves of a Stalke or Tree called Arundee which bears a Round prickle berry of which oyle is made. Vast quantities of this cloth is made in the country about Goora Gaut beyond Serrpore Mercha [unidentified] where the worms are kept as Silke worms here. 'Twill never come white, but will take any colour, 'twill not rot nor receive damage by wet, it burnes like hair not in a flame nor keeps fire long, and wears to admiration, insomuch that when the Cloth is first made 'tis given up and down to poor people to wear and to lay in shops to be footed upon before 'tis fit to be sold . . . usual dimensions about 8 coveds long 1½ broad, sold at ½ rupee the piece."

Records of Fort St. George: Diary and Consultation Book, 1679-80, p. 150.

BAFTAS, BAFFETAS, ETC. Western India. Persian *bafta*, 'woven'. A generic term for plain calico of Gujarat (esp. Broach and Nosari), varying in quality from coarse to fine—the latter costing double the former. Saleable in most markets. *Baftas* sent to Europe were usually white, but for Asian markets they were more commonly dyed red, blue or black. After the Gujarat famine of 1630 they became scarce and were imitated in many other parts of India, the term thus losing all local significance.

1611. 'Here (at Broach) are made the rich *Baffatas*, in fineness surpassing Holland cloth . . . ' Finch, *Early travels*, 175.

1643. 'The narrow *baftas* of Surat and Nosari making are the most true and substantial cloth of all India.'—*English factories*, 1642-5, 123-4.

BECUT POOREES. See under TUCKERYES.

BETILLES. South India. From Portuguese *beatilla*, 'veiling'. A Deccan name for muslin. Coromandel exports came mostly from Golconda, especially the neighbourhood of Warangal. Lengths varied from 15 to 25 yards; breadth usually 1½ yards. They were sometimes dyed red, and sometimes striped or flowered with embroidery, much in demand in Europe as Neckcloths. The fine grades were sometimes reinforced with thin wire thread.

1682. '*Betilles* . . . The stripes to be of great variety . . . some flowered between the stripes, some all flowered.'

Records of Fort St. George: Despatches from England 1681-6, 20.

1704. 'Send us as many *Beettelles Oringal* [Warangal] of a stiff wiry thread as you can get and good clear cloth, they are now much in demand for Neckcloths and other uses . . . ' Letter Book X. 751.

BIRDS EYES. Western India. Probably Hindi *bulbul chasham*, 'bulbul's eye', denoting a chequered pattern with dots. A cheap chequered or striped cotton cloth, the pattern being woven. Probably bought only for the slave markets.

1662. 'We formerly received from your parts [Gujarat] a Striped or Chequered sort of callicoes, called *Birds Eyes* . . . '—Letter Bk. III, 163.

BOOKE CALICOES. A name derived from the book-like form in which some of the finer calicoes were folded and marketed in India.

1608. ' . . . a booke, which containeth 14 English yards.'—Finch, *Early Travels*, 175.

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BOXSHAES, BUXSHAWES. South India. Piece-goods of uncertain description ; but the fact that they were sometimes called *boxshawe ginghams* suggest that they were a particular type of *gingham* (s.v.). They were sent mainly to Siam and Japan.

1615. 'We have sold some of your *Buxshawes* . . . If they had been any other colour but this rusty red, they would all have sold before now . . . ' Letter from Agent in Japan. *Letters received*, vol. III, 250.

BRAWLES. Western India. A cheap blue-and-white striped cotton cloth, patterned in the loom, classified as a '*guinea-stuff*' (s.v.) and much in demand by the slave traders. They were copied by English weavers at the end of the century.

BUTTANEES. Western India. A medium-priced cotton cloth with blue-and-white stripes, patterned in the loom. Sold in Europe at the beginning of the century only.

1614. Sold in London: '. . . blue-and-white *Buttones* stript, about ¾ yd. broad and 5½ yds. long.'—Court Bk. III, 182-3.

BYRAMS. BEIRAME (Portuguese), BERAM (Dutch). Western India. From Persian *bairam* (?). In the sixteenth century and earlier, *byrams* were famous as a superior white calico, which the Portuguese sometimes called *beirames de Roma*, on the assumption that they were similar to the fine cloth brought to Europe by the ancient Romans. In seventeenth-century records, however, *byrams* are often a coarse and inferior calico, usually dyed red, blue, or black for Asian markets. They were produced mainly in the Burhanpur area.

c. 1585. '. . . out of Cambaya (come) . . . red *Beyramen* great and little, which is very like unto Cambricke.'—Linschoten, *Voyage*, I, 114.

1609. 'A sort of cloth called *Byramy* resembling Holland cloths . . . of diverse prices.'—*Letters Received*, I, 29.

1610. '*Bearam* white and black of a coarse sort . . . ' Letters received, I, p. 75.

CADDY. Especially Western India. Probably Hindi *khadi*. A comparatively cheap. plain woven calico, commonly used as a cloth for cheap cotton-painting.

CAINGOULONS, CAINGOULONS. South India. From Malay *kain*, " cloth " and *gulong*, 'rolled'. The term implies that they were exported in rolls. Cloths named thus were apparently patterned in the loom and usually incorporated gold thread. They were woven in Tanjore area and perhaps intended chiefly for making into Malay *sarongs*.

CALLAWOYPOOSE. Western India. A cheap striped or chequered cloth, patterned in the loom. Apparently bought only for the slave traders.

CAMBOOLEES, CULBULEYS, ETC. Western India. Sanskrit, *kambala*, a woollen blanket or upper garment ; Hindi, *kamli* ; Portuguese, *cambolim*, 'cloak'. In English records, *cambolees* referred to cloth of mixed silk-and-wool, made in Sind.

c. 1690. 'They manufacture [in Sind] . . . in silk mixed with Carmania wool, called *culbuleys* . . . " Hamilton, I, 126.

CAMCANYS, CAYMECONYES. North-east India. A plain muslin woven near Patna, somtimes compared with *cassas* (s.v.). They were particularly in demand for Persia, but the East India Company sometimes shipped them to London for re-export to North Africa and Turkey.

1620. " The caymeconyes of Bihar I with you accord to be a commodity fitter for Persia than England, yet as fit for Barbary or Turkey as any other place."

English Factories in India 1618-21, p. 206.

CANNIKENS, CANEQUIMS (Portuguese), CANDEQUEES, ETC., Western India. A cheap coarse calico, dyed blue or black. The name apparently derived from 'their shortness and dying' (see below). The material was probably synonymous with *baftas* (s.v.). Chiefly woven at Broach and Navsari, and saleable in all the main Asian markets. The word rarely appears in the records after 1650.

1616. '*Candyques* of Brothia [Broach] are most staple commodities in

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all parts of this country [Achin].' *Letters received*, IV, 23.

1619. '. . . *camnikeens* . . . we pray you to be advised that their shortness and dying gives that name . . . being made of *baftaes*.' *English factories*, 1618-21, 142.

CAPPEREES, Western India. A cheap blue-and-white chequered or striped cloth, patterned in the loom. Classified as 'guinea-stuff' (s.v.) and exported mainly for the slave traders. Woven in Gujarat.

1630. 'Of short stuffes (blue and white checkered or striped) of 4 yds. long, be they *capperees*, *populees*, *bassanees* or *chuckerees* . . .'—*English factories*, 1630-3, 8.

CAROLEES, Western India. A cloth similar to *capparees* (s.v.) and bought for the same purposes, but woven mainly in Sind.

CARRIDARIES. See under CHARADARIES.

CASSA. See under COSSAES.

CATCHES, CATTAKETCHIES, CASHEES, etc., South India, especially Tuticorin. A calico of unknown description, in demand in many parts of Asia. A few shipped to Europe as well.

1644. '*Catches* . . . a sort of cloth very vendible in the Manillas and all parts.'

English factories, 1642-5, 252.

1647. 'Cattches . . . a sort of cloth vendible in Persia to very good advance.'

English factories, 1646-50, 106.

CHADARS, CHADORS, Western India. Hindi *chadar*, traditionally a kind of shawl or *dopatta* (s.v.). Not to be confused with *chautars* (see below). Exported to the Malay Archipelago as '*chador pintados* (i.e. painted cotton *chadars*).'

CHARADARIES, CARRIDARIES, etc., North-east India. Striped or chequered woven cloth, probably of mixed silk-and-cotton. First mentioned in the late seventeenth century.

1716. "Carridarries, 5,000 pieces, variety of colour stripes with as much variety of stripes as in Doreas."

Letter Bk. XVI, p. 9.

CHARCONNAES, CHERCONNAES, North-east India. Hindi *chārkhāna*, 'chequered'. Striped or chequered cloth of mixed silk-and-cotton, woven in Orissa. Exported only occasionally and in small quantities. In the 19th c., Forbes Watson (*Textile Manufactures*, 78) described 'charkana' as "chequered muslin . . . as regards manufacture very similar to the *Doreas* (s.v.). They differ in breadth of the stripes, their closeness to each other, and the size of the squares." Yusuf Ali (*Monograph on Silk*, 93) wrote, "The word *chārkhāna* simply means 'check,' but the term is applied to certain silk or mixed fabrics containing small checks, usually about 8 or 10 checks in a line to an inch."

1632. ". . . *Charconnaes* lynnen, striped with white silk, from Orissa . . ."

Mundy, *Travels*, II, 155.

1716. "*Cherconnaes* . . . should be made with only cotton thread and silk and not the sort of thread which is the cause of badness of the Romals Gurras, but they must be of variety of colours, very few yellows but most Red and White."

Letter Bk. XVI, p. 9.

CHAUTARS, CHOWTERS, ETC., Western India. A plain white calico, usually of superior quality and much in demand for shirting. Exported mainly to the Malay Archipelago. The modern Gujarati cloth called *chotari* has four threads in each warp and weft, and the seventeenth-century *chautars* may have been the same. Woven in many parts of Western India.

CHELAS, CHILLAES, CHELLOES, North-east India. Possibly Hindi *sela* from Sanskrit *chela*, *chaila*, 'a kind of scarf or mantle' (Platts). In 17th c. records it is described as a cotton handkerchief, usually striped blue-and-white. Exported to England at the end of the century in small quantities. Hobson-Jobson identifies it with '*Shalee*, *Shaloo*, *Shella*, *Sallo*' (p. 818/19) but seems to be confusing at least three distinct fabrics.

1710. "*Chellas*, all cotton, to be made as fine as you can get them and of

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blew and white stripes . . . 500 pieces."

Letter Bk. XIII, p. 800.

1721. "The *Chillae* handkerchiefs are very good of the sort."

Letter Bk. XVII, p. 586.

CHELLOES, Western India. Probably the same derivation as *Chelas* (see above). A cheap cotton cloth with red, blue or black stripes, patterned in the loom. It is not mentioned before the end of the century, when it was perhaps required mainly for the slave traders. Sind produced the best *chelloes*, and they also made 'a sort of silk *Chelloes* which are strong and glossy'. Letter, Bk. IX, 45.

CHILLIES, CHELLIES, South India. A cheap checkered cotton cloth, woven mainly in Madras area and exported to Malay Archipelago.

1650. "... *chellies Madrasapatam*, which are a checkered sort of cloth . . ."

Official Correspondence, no. 2139.

CHINTES, (MODERN ENGLISH CHINTZ). From vernacular (non-Aryan) *chitta*, 'spotted cloth'; Hindi *chint;* Marathi *chit*. Applied in the English records to any painted or printed calico. The factors used 'chintes' as a plural, and our modern 'chintzes' is therefore a re-duplication.

1614. '*Chintes* of palamposh . . .'—Factory Records Misc., vol. 25,99.

1626. '. . . painted cloth called *chits* . . .' Pelsaert, 9.

CHIRANS, Western India. Cheap calico usually listed with chequered goods in the category of '*guinea-stuffs*' (s.v.). Exported both to the East and West Indies.

CHOWTARS. See under CHAUTARS.

CHUCKLAS, CHUCLAES. Bengal. Probably Hindi *chaklā*, which Platts defines as 'a kind of cloth made of silk and cotton'. They were usually striped. Exported to Europe in small quantities.

1688. "Chucklaes of small stripes and lively colours."

Records of Fort St. George: Despatches from England, 1686-92, p. 152.

CHUCKEREES, Western India. Either Hindi *charkhana* 'chequered' or Gujarati *chokadi*, 'a group of four'. A cheap chequered calico, patterned in the loom. They were classified as '*guinea-stuffs*' (s.v.) and bought mainly for the slave traders.

CHUDDAR. See under CHADAR.

COMCONNAES, North-east India. Plain cotton cloth, usually of inferior quality.

1701. "*Comconnaes* of late have come very bad and by their thinness are esteemed Muslins and pay 15% new duty."

Letter Bk. X, p. 539.

COSSAES, CASSA, KASSA, North-east India. Arabic-Persian *khāss*, 'choice,' 'select.' Plain muslin, usually of good quality, woven mostly in Dacca District. They were exported extensively to the markets of S. E. Asia, the Middle and Near East, and Europe. Those sent to Europe were usually of medium quality, the finest being reserved for Eastern markets. In the *Ain* (I, 94), *Khāçah* is included among cotton cloths.

1612. "They [the people of Sumatra] had rather deal for cloth of Surat and Bengal especially *Cassia* both white and red, and great profit to be made of such cloth if it be provided either in Cambaia or Masulipatam, for the *Cassia* which I know by certain information to cost there but ¾ rial is here worth 3 rials . . ."

Letters received, I, 255.

1629. "The finest and richest *cassas* are produced in this country [Bengal], from 50 to 60 yards long and 7 to 8 handbreaths wide, with borders of gold and silver or coloured silks. So fine, indeed, are these muslins that the merchants place them in hollow bambus, about 2 spans long, and, thus secured, carry them throughout Corazane, Persia, Turkey, and many other countries."

Manrique, *Travels*, I, pp. 65/7.

CULBULEYS. See under CAMBOLEES.

CULGARS. Western India. (See p 20 above.) Gujarati *culger*. A printed silk cloth

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woven in Gujarat, exported to England at the end of the century. There is available at Ahmedabad to-day a printed artificial silk *sari*, simulating tie-and-dye patterns, called *kalger*.

CUMMERBUND. Urdu *kamar-band*, 'loin-band', e.g. a sash or girdle worn round the waist.

CUMMUNS. South India. A particular type of Golconda muslin, otherwise known as *cummun betilles* (s.v.).

CUSHTAES. North-east India. Either striped or chequered cloth, possibly of mixed cotton-and-silk. Occasionally mentioned at the end of the century. Hobson-Jobson (p. 707) suggests the word is after Kushtia, a place in Nadia District.

1720. "*Cushtaes* Blue and White . . . They must be made clear and the Blue and White as distinct as the Pattern now sent of a Niccanee from Bombay."

Letter Bk. XVII, p. 359.

CUTTANEES. Western India. Persian *qutni*. An important Gujarati export cloth of mixed silk-and-cotton with satin weave, usually striped and sometimes interspersed with flowers. Much in demand for the making of quilts, which were popular in England. Woven chiefly in the Ahmedabad-Cambay area. A sample fabric called "Kootnee," which is probably related to cuttanees, can be seen in Forbes Watson, vol. XV, no. 569

1614. '*Cuttenees*, a kind of satten, half cotton, half silke.'—Factory Records Misc., vol. 25, p. 56.

1681. '. . . send us some striped and some flowered *cuttanees* all made of silk.'—Letter Bk. VI, 346.

1696. Ordered for London: '*Cuttanees* striped and flowered, all new fancyes according to the fancy of the Countrey, the satin well covered.' Letter Bk. IX, 506.

DERIABADS, Uttar Pradesh. After Daryabad, Bara Banki Dt., U.P. A good quality plain white calico, often brought to Broach by the English for bleaching. Exported to Near East and to England. Not mentioned after 1650.

1644. '. . . *Dariabads* . . . the best made of any cloth that comes [from Agra] . . .'—*English factories*, 1642-5, 204.

1647. '. . . *deriabads* . . . have of late years much declined in goodness . . .'—*English factories*, 1646-50, 78.

DOPATTAS. From Hindi *dupatta*, a garment used like a wrap, literally 'a cloth in two widths'. 'Dopattas' exported from the Coromandel to the Malay Archipelago were usually of painted cotton, also known as *Jeckandames* (s.v.).

DORBELLAS. After Darbelo, Hyderabad Dt., Sind. A synonym for the *baftas* (s.v.) or *joories* (s.v.) made at that town.

DOREAS. North-east India. Hindi *doriyā*. A striped or chequered fabric of mixed silk-and-cotton, woven in the Malda-Kasimbazar area. Extensively exported to Europe at the end of the century. In the *Ain* (I, 95) is listed among cotton stuffs. Describing '*Duriyas*' made in Bhagalpur District in 1812, Buchanan-Hamilton wrote: " . . . the warp consists of three parts of cotton and two parts of Tasar or different colours. The woof is all cotton of one colour, so that the cloth is striped lengthways, and is dyed entirely by the weavers in the thread . . . " (India Office Mss. Eur. D. 82, f. 63). See also under *Alacha*.

1699. " . . . *Doreas* depend much on fancy as to the works and stripes, but it is essential to their value that they be most of them of a fine thread clear and thin, and the stripes of as great variety as you can, some single, some double, or treble or more stripes, some small, some a little larger stripes and other checkered, and some finely wrought with flowers between the stripes, which you call *Jamdennies* . . . "

Letter Bk. X, p. 253.

1707. "The greater variety of stripes in the *Doreas* the better, but there should not be too many stripes

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together in any one piece. That is to say if a piece has in one row 5 or 6 stripes the next row must not be 5 or 6 but only 2 or 3, and then 5 or 6 again, and so on . . . "

Letter Bk. XIII, p. 105.

DRAGAM, DRAGON. South India. Cheap dyed cotton cloth, much in demand in the Malay Archipelago. Usually described as " black and red " presumably either striped or checkered.

DUNGAREES, DONGERIJS (Dutch). West Coast. Hindi, *dungri*. A strong coarse calico with multiple warps and wefts woven mainly in the Goa region, usually dyed brown. Exported to Malayan Archaepelago and also to Europe. Samples can be seen in Forbes Watson, vol. XII, nos. 471, 473 and 474.

DUTTIES, DHOOTIE, etc. Western India. Probably Gujarati *doti*, surviving locally as the name of a coarse cotton cloth (therefore unconnected with Hindi *dhoti*, ' loin-cloth ', as sometimes suggested). The records make it clear that *Dutties* were a strong coarse cloth used mainly for sails and as a packing material. Usually sold in lengths of 12 to 15 yds X 1 yd, and woven chiefly at Dholka.

1609. " Here is also a strong sort of cloth called *Dhootie*."

Letters received, I, 29.

1614. " . . . strong *Dutties*, such as may be fit for making and mending sails."

Letters received, II, 219.

1619. To be provided for Persia: " . . . five bales of Dholka *dutties* for merchandise, and a quantity of coarser for embaling their silk."

English factories, 1618-21, 142.

ECKBRAIES. Foster has suggested that this word is derived from Akbarpur, a town in Fyzabad Dt., U.P., and he is supported by the fact that they were usually bought in this region. An alternative possibility is Hindi *eckbari*, lit. ' one *bari* (a measurement denoting 36 inches)', and this is supported by the fact that *eckbaries* were often described in the records as ' larger and longer ' than cloths such as *mercoolees* (s.v.), which were usually less than 36 inches in breadth. *Eckbaries* were plain white cloth, often bought for making into chintz and quilts, and sometimes sent to Ahmedabad for ordinary dyeing. They were sold in all the main markets during the 1640's and 1650's.

1642 ' *Eckbaries* . . . a larger and longer sort of Agra clothing than the *Mercolees* (s.v.)'.—*English factories*, 1642-5, 6.

ELATCHES. See under ALACHAS.

FAUTAHS, FOOTAES. See under PHOTAES.

GARRAS. See under GURRAS.

GINGHAMS. North-east India. The origin of the term is obscure, and the evidence confusing. The original *Gingham* was apparently a cloth of mixed cotton and Tussur silk. Since the true nature of Tussur as a wild silk was commonly misunderstood by Europeans in the early 17th century and thought to have been " spun from a herb (hence giving rise to the synonym ' *Herba* ')", *Gingham* is often wrongly described as having been a mixture of cotton and grass or bark-fibre. Further complications arise from the fact that the true *Gingham* of cotton-and-Tussur was imitated in pure cotton, the main distinguishing feature of all cloths traded under this name being apparently its unusual texture with multiple-stranded warps and wefts. Bengal *Ginghams*, extensively exported to Europe in the second half of the seventeenth century, were perhaps always of mixed cotton-and-Tussur, and usually had striped patterns: it was presumably these which brought the word into the English language in the sense of a cloth " woven of dyed yarn, often in stripes and checks", as the Oxford English Dictionary describes it. Pure cotton *Ginghams*, presumably imitating Bengal *Ginghams* in texture and pattern (but sometimes also plain white), were exported in smaller quantities from Masulipatam and further South. Atypical striped Bengal

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Gingham of the mid-19th century is preserved in the Victoria and Albert Museum (I.S. 8848), but in this case the silk is *moonga*, not *tussur*.

1670. Ordered from Bengal: " 2,000 pieces of striped *Ginghams* according to pattern now sent. 10,000 coloured *Ginghams*, 10 yards long, full yard wide, most Graies, even collours, free from Rowes, and of best sorts."

Letter Bk. IV, p. 403.

1676. " About Hughly there live many weavers, who weave cotton cloth and cotton and Tesser [Tussur silk], or Herba, of several sorts . . . a Settlement was thought the more convenient, because *Ginghams*, *Herba Taffatye*, and *Herba Lungee*, and other sorts of *Herba* goods might be made and brought hither . . . " Clavell, quoted in Hedges' *Diary*, II, pp. ccxxxix-xl.

1681. Ordered from Bengal: " Tesera [Tussur] or herba threads or yarn, part raw, part dyed, of the best sort that *Ginghams* and *Nillaes* (s.v.) are made of . . . "

Letter Bk. VI, p. 413.

1689. Ordered from Coromandel Coast: "*Ginghams* white such as the Dutch have of 4 threads, or as we had in Agent Foxcroft's time double-threaded both ways."

Letter Bk. VIII, p. 432.

GUINEA-STUFFS, GUINEA-CLOTH. Western India. After Guinea, the name applied to part of the western coast of equatorial Africa, which was the main source of the slaves sent to the West Indies. *Guinea-stuffs* was the generic term for a wide range of cheap, brightly-coloured Indian calicoes, mostly striped or chequered, and very popular with negroes. They were shipped first to London, where they were sold for re-export by the slave-traders to Guinea and the West Indies. They are not to be confused with *gunnies* (see below).

GULDARS, GULDAREES, ETC. Western India. Persian *gul-dar*, ' spotted ' or ' flowered'. A name for fine muslin turban-cloths, embroidered or brocaded. They were greatly in demand in the Near East, especially Turkey. Bought mostly in the Burhanpur area.

1630. ' *Guldares* will sell in Turkey in infinite quantities . . . for evidence whereof you may please to observe that they are the chiefest commodities wherein the Persians and Armenians who takes yearly passage on your ships doe invest great sums of money here in India . . . '—*English factories*, 1630-3, 124.

1636. ' . . . guldaree . . . having silver or gold thread in the heads . . . '—*English factories*. 1634-6, 297.

GUNNIES. Western India and Malabar Coast. Sanskrit *goni*, ' sack '. A strong coarse calico (which in later times was usually jute or hemp) used for sacking and as covering for bales; also sent to England as piecegoods. Woven mainly in the Rajapur and Karwar areas (north and south of Goa respectively), and to a lesser extent at Broach.

GURRAS, GARRAS. North-east India. Plain cotton cloth, comparatively coarse, woven especially in Orissa and occasionally exported to Europe. This is probably the Hindi *gārbā*, which Forbes Watson (*Textile Manufactures*, 83) describes as " unbleached fabrics which under names varying in different localities, constitute a large proportion of the clothing of the poor. They are used also for packing goods, and as a covering for the dead . . ." Samples can be seen in Forbes Watson, vol. VIII, nos. 297, 299, 300, 302 and 306.

GUZZEES. Western India. Hindi *gaz*, a measure which varied in length in different areas. The Surat *gaz* was between 26 and 27 ins. (*Letters received*, III, 11); at Ajmer, 32 ins. (*Letters received*, III, 17). The *Ilahi gaz*, introduced by Akbar to supersede these as a standard, was 33 ins. *Guzzees* were an ordinary plain white calico, chiefly woven at Gokul, in Muttra Dt., and usually dyed at Ahmedabad. As dimensions varied, it is not clear how they came to be known as *guzzees*. The term *gaji* is used in

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Gujarat to-day to denote a kind of coarse cotton cloth. A sample can be seen in Forbes Watson, vol. VIII, no. 298.

1642. 'The cloth is very even and substantially made near Agra, and there termed *Guzzees*, of uncertain length . . . of which in Ahmedabad *cannikens* (s.v.) of both sorts, *ardeas* (s.v.), blue *baftas* (s.v.), and the like are made and sent to Mocha, Persia, Bussora, etc.'—*English factories*, 1642-5, 7.

HERBA. North-east India, esp. Bengal. A synonym for the wild silk known as Tussur or Hindi *tasar*. Early European travellers had the erroneous idea that Tussur was not a silk but "spun from a herb." This arose from the fact that the Tussur cocoon, in its natural habitat, looks like an organic part of the plant from which it hangs—so much so that even the famous Dutch botanist Rumphius was at first deceived into thinking that it was a fruit of the plant, until he actually cut one open and found the chrysalis inside. 'Herba' continued in use as a synonym for Tussur long after its real nature was understood.

1565. "*Herba* . . . a kind of silk which grows in the woods without the labour of man, and when the bole is grown as round and large as an orange, then they take care to gather it."

Fedrici, *Voyage*, p. 236.

1619. "*Herba* . . . a kind of Bengala stuff of silke grasse called tessar . . "

British Museum, Egerton Ms. 2122, f. 112.

HAMMAMS. See under HUMHUMS.

HUMHUMS, HAMMAMS, HAMOENES, etc. North-east India. Plain cotton cloth of varying quality, woven in many parts of Bengal. Exported in small quantities. Taylor, writing in the 19th c. derives the word from Arabic *hammām*, 'a Turkish bath,' "apparently so named from its having been originally used at the bath" (*Cotton Manufacture of Dacca*, 63). Adds that is a cloth of a thick stout texture, generally worn as a wrapper in the cold season.

HUSSANEES. Western India. A cheap chequered or striped calico, patterned in the loom. Classified as *guinea-stuffs* (s.v.) and bought mainly for the African slave traders.

IZAREES. Andhra region. From Telegu *istree*, 'pressed'. Hence *Longcloth izaree* or *izaree ginghams* implies that the cloth was finished with a very smooth surface.

JAMAWARS. North-east India. Hindi *jāmāwār*, 'sufficient for a Jāma (gown).' The Jamawars occasionally bought by the English Company were piece-goods of silk brocade, woven in the Malda-Kasimbazar area.

1709. Ordered from Bengal: "Silk Jamwars 10 yards. × $\frac{1}{8}$th broad, Brocaded with flowers, light colours, 1,000 pieces."

Letter Bk. XIII, p. 674.

JAMDANIES, JAMDANNES, Bengal. Persian and Hindi *jamdāni*. Muslin, brocaded in white or coloured silk or cotton, usually with floral pattern. They were sometimes woven with mixed cotton-and-silk in the manner of Doreas (s.v.). Exported to England in small quantities from 1670 onwards. In the 19th c., Taylor (*Cotton Manufactures of Dacca*, 48) described them as "the most expensive productions of the Dacca looms." Samples can be seen in Forbes Watson, vol. VII, nos. 253-4. Other specimens in the Victoria and Albert Museum (e.g. 0449 I.S. and 0447 I.S.)

1707. "Jamdanies . . . these sorts of flowered goods if they were made on a fine cloth and not frayey would sell well, but if on a coarse or frayey cloth as they generally come they turn to no account. The flowers on thick cloth are not valued because they don't show themselves. The smaller the flowers generally the better, and some pieces trail work running through the whole piece in the

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same manner as the Gold Atlasses."

Letter Bk. XIII p. 104.

JECKANDAMES, YECKANDAMES. South India. The name given to a particular sort of painted cotton *dopatta* (s.v.) mainly sent to Siam.

1612. 'Jeckandames are painted dupetties'.

British Museum, Cotton ms. III. 13.

JELOLSIES. Bengal. Cotton cloth, which was sold both plain and 'flowered.' Nothing more is known about them.

JOORIES. Western India. Possibly Hindi *jhūrī* (*vide* Moti Chandra, Lalit Kala, No. 8, 1961). Plain white calico of Sind, corresponding to Gujarat *baftas* (s.v.), woven chiefly at Naosarpur, Darbelo and Kandiaro. They were shipped to London as a substitute for Gujarat *baftas* after latters became scarce.

KASSA. See under COSSAES.

KEESES, KESTES, QUESOS, etc. Western India. Hindi *khes*, a kind of *dopatta* garment. Specimens collected under this name in the mid-19th century and preserved in the Victoria and Albert Museum (e.g. I.S. 091) are thick cotton cloths woven with double warps and wefts, the individual threads also being in pairs. Patterns were usually an elaborate check usually in blue and white, but sometimes in other colour combinations (e.g. red and green), woven in such a way that the colours alternate on the two sides.

KERYABADS. Uttar Pradesh. After Khairabad, Sitapur Dt., U.P. A good quality plain white calico, much in demand for the English home market on account of its exceptional length and breadth.

KESTES. See under KEESES.

LANSOLL, LAUZOLLS. South India. A sub-category of *Ginghams* (see above), otherwise known as *Lauzoll ginghams*, especially noted for their greater breadth than ordinary *ginghams*. They were exported chiefly to Siam, and the word *Lauzoll* may be the corruption of a place name. The occasional mention of *painted lauzoll ginghams* in the records is difficult to explain.

LAYCHES. See under ALACHAS.

LONGCLOTH, South India. The ordinary, staple cotton-cloth of Coromandel trade, especially esteemed in Europe on account of its length (usually about 37 yards). It varied widely in quality and price. In the first half of the century most Longcloth was woven in Golconda, but later it was produced mainly in the Madras area. It was usually exported white, but it could also be bought blue or brown. Samples can be seen in Forbes Watson, vol. XII, nos. 464 and 465.

1621. "This sort of *Longe cloth* it seems by their advice is the best and only sorte which that place [Masulipatam] affords fitting for Europe, all other sorts being so thin . . ."

English factories 1618-21, 343.

LUCKHOWRIES, LAYCOWRIES. Bihar. A synonym for Ambertees (s.v.), after Lakhāwar, in Gaya District, which was the principal market for purchasing *Ambertees*.

MADAFONS. South India. A striped cloth woven chiefly in Golconda and Madras State and exported to Malay Archipelago. Little else about it is recorded.

MALMAL, MULMULL, MOLLMOL, etc. North-east India. Hindi *malmal*, muslin. Usually a fine muslin and a staple commodity of Bengal often embroidered with floral motives for the English market, where it was in demand for peticoats.

1684. Ordered from Bengal: ". . . a good quantity of flowered *mulmals*, the flowers to be wrought upon the finest Mulmuls, and 5,000 or 6,000 pieces to be wrought variously, some with silk or silver, some with silk and gold and some with gold and silver."

Home Misc., vol. 803 p. 426.

MANDILLA, MUNDILLA. North-east India. Striped fabric of mixed silk-and-cotton,

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woven in the Malda-Kasimbazar area. Usually very colourful. Exported to England at the end of the century.

(See also MUNDEELS, below.)

MATAFONS. See under MUFTOONS.

MEANAES. Sind. Silk cloth woven in Sind and exported mainly to Persia. They are not often mentioned in the English records.

MENTASSES, MONTASSIES. Western India. This is probably the same as the modern *minatashi*, described by Watt (p. 531) as "enamelled fabrics, a name given to a cloth of gold with coloured designs on the surface." It was bought in the Cambay area and exported to the Malay Archipelago.

MERCOOLEES, MERCULEES, etc. North India. A good plain white calico, woven in Jaipur and in the Lucknow area. Shipped to London in large quantities, and sometimes bought for transforming into chintz.

MOLLMOL. See under MALMAL.

MOREES. South India. One of the categories of staple cotton-cloth woven on the Coromandel Coast, usually of superior quality and much in demand in Europe as a substitute for linen cloth. It was also used for chintz-making. The traditional centre of manufacture was Masulipatam, but later in the century it was also woven in the Madras area. Usual dimensions were about 9 yards x 1 yard 8 inches.

MUGA, MOONGA, MOOGA, etc. North-east India, especially Assam. Bengali *muga*. Silk produced from the wild silkworm *Antheraea assama*, which could be partially domesticated. The characteristic colour of muga-cloth is a bright yellow, more glossy than the Bengal wild silk known as Tussur (s.v.) with which it is sometimes confused. European merchants thought that both Tussur and Muga were "spun from a herb" and therefore called them Herba (s.v.).

1626. "... Moga which is made of the bark of a certaine tree."
Purchas, *Pilgrimage*, p. 1005.

MULMULL. See under MALMAL.

MUNDEELS. Bengal. Possibly the same as Mandilla (see above).

1680. "The *Mundeels* whose strip the Company have ordered to be made long-ways we on talking with the brokers and weavers find not possible to be done, for then the silk that now is the wooving and occasions the short stripe by covering the cotton warp must be in the warp, by which means as was demonstrated to us the *Mundeel* will become a slight *Elatcha* and retain nothing of its lively colour and glossiness, wherefore it is thought fit not to alter them ..."

J. A. S. B., vol. 14, N.S., 1918, p. 9.

MUTTFOONS, MATAFONS, etc. Western India. A low-grade chequered calico bought for the Malay Archipelago. Woven mainly at Cambay, but not mentioned after 1650.

NAINSOOKS, NANSOOKS, NYANSOOKS. North-east India. From Hindi *nainsukh*, 'pleasure of the eye.' Plain cotton cloth of superior quality which Forbes Watson (p. 76) says was used for neckerchiefs and Taylor (p. 46) defines as "a thick muslin, apparently identical with the *tunsook* (*tansak'h*, Blochmann, i, 94) of the Ayeen." Yusuf Ali (p. 95) refers to a silk cloth of the same name, imitated from the cotton fabric.

NEHALLEWARS. Bengal. Striped fabric of mixed cotton-and-silk, woven in the Malda-Kasimbazar area.

NILLAES. Bengal. Hindi *nilā*, 'blue.' Striped cloth of mixed Tussur silk and cotton, occasionally flowered. Exported in large quantities to Europe in the last quarter of the century.

1679. "We find the *Nillaes* that are most vendible are the sort that are finest and most Glossy and striped with the lightest colours as hair colour, sky colour and the like, but those that are Red and

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Tauny ground striped with black are not vendible here [London]."

Letter Bk. VI, p. 21.

NICKANEES. Western India. A cheap striped calico, patterned in the loom. Bought mainly for the slave markets, and woven at Broach and Baroda. *Nickanees* may be the same as modern *nakhunas*, described by Watt as having 'the warp white and, the weft striped in various colours.

NYANSOOKS. See under NANSOOKS.

PALAMPOSH, PALAMPORE. Persian and Hindi *palangposh*, 'bed-cover'. Assimilated into English as 'palempore,' usually in the sense of chintz bedspread.

1614. 'Chintes of palamposh . . .'—Factory Records Misc., Vol. 25, 99.

PARICALS. See under PERCALLAS.

PATOLA. Western India. Gujarati *patolu*. A well-known type of silk cloth, the warp and weft being tie-dyed before weaving according to the pre-determined pattern. *Patolas* were exported mainly to the Malay Archipelago, measurements varying according to the needs of different markets. The larger sizes were specially commissioned. Chief centre of *patola* weaving was Patan, north-east of Ahmedabad.

1670. '. . . *Patoles*, which are stuffs of silk, very soft, decorated all over with flowers of different colours . . .'—Tavernier, *Travels*, II, 3.

PATTA. South India. A cheap dyed cotton cloth, usually striped, but varying in style according to the particular local market for which it was intended (for instance, there was *Patta chara malayu*, '*Patta* in Malay-style', *Patta macasser*, '*Patta* in Makassar-style', etc.). There is one isolated reference to '*Petas* striped with silk' (*Letters received*, II, 32).

PAUTKA, Western India. No description has been traced in the English records, except that they are once mentioned as 'white, blue and brown' (probably meaning three separate categories of cloth). They were calicoes, bought mainly for the slave traders.

PENIASCOES. North-east India. Brightly coloured fabric, probably of mixed cotton-and-silk, usually striped. Exported in small quantities at the end of the century.

1710. "*Peniascoes*, 1,500 pieces, to be chiefly striped and all lively colours."

Letter Bk. XIII, p. 106.

1709. "The *Alibannees*, *Peniascoes* and *Gurras Romalls* prove general rotten, the silk that runs through the piece is naught being harsh silk and ought to be soft silk . . ."

Letter Bk. XIII, p. 660.

PERCALLAS, PERCALLAES, PARICALS. South India. A high-grade plain cotton cloth, especially noted for fineness and regularity of weave as well as for durability. They were woven in the Madras area as well as Golconda and were the kind of calico best suited for chintz. Dimensions were about 8 x 1 yards. They were occasionally bought red.

PHOTAES, FAUTAHS. Western India. Sanskrit *puṭa* and Persian *foṭa*, meaning a cloth worn over the private parts. Classified in the trade records as 'clothing' and made of dyed calico, usually blue and white. Exported to both the East and West Indies.

1615. "As for the sale of the Surat clothing . . . if you have . . . *lunges* [*lungis*] and *footaes* of all sorts that will not vend in Japon, to send them away for this place [Siam] . . ."

Letters received, IV, 306.

1707. "Phota's, 1,000 pieces, not in Clouts, the Clouts will not do, that is to say the Partition that is in each part of the Pieces as they generally come, but that Partition must be filled up with the same work as the rest of the Piece is . . ."

Letter Bk. XIII, 107.

PITCHARIES. Western India. Coloured calicoes, exported mainly to the Malay Archipelago. They were perhaps similar to a calico still available in Ahmedabad to-day called *pachedi* or *pichodi*, popular

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among shepherds and cowherds : they are sold in two different sizes for waist-cloths and *dhotis*, with a plain field of either white, red, blue or maroon, plain borders and wide cross-borders.

POPULEES. Western India. A cheap chequered calico, patterned in the loom. Classified as *guinea-stuffs* and bought mainly for the slave traders.

QUESOS. See under KEESES.

REHINGS, REYNGS, RANG, RAINGS, etc. North-east India. Hindi *rang*. Fine muslin, exported to Europe in small quantities at the end of the century. In the 19th c., Taylor (*Cotton Manufactures of Dacca*, 44) wrote : "*Rang* is a muslin which resembles *jhuna* in its transparent gauze or net-like texture. It is made by passing a single thread of the warp through each division of the reed."

SABOONS. Sind. A local name for cloths similar to *Alachas* (s.v.). Mainly exported to Persia.

SACERGUNTES, SAUERGUNTES, SAURUNCHERAS. South India. A type of cotton cloth, the warp and wefts of which were tie-dyed before weaving in the same way that *Patolas* were made. A few were shipped to England.

1690. "*Sacerguntes* callicoes—dyed in the thread before made."

Bodleian Library Ms. Rawl. A. 303,62.

SAHANS, SAHUNS, TSEHEN. North-east India. Possibly from Hindi *sahan*, "enduring." A superior, strong calico, woven especially in Orissa and sometimes sold in Europe for sheets.

1626. Among products of Puri, Orissa : "... *tsehen*, a superior wide cloth suitable for bed-sheets, but little of it is brought to Agra owing to the high quality and cost."

Pelsaert, p. 8.

SALALAS, SALLALO. South India. A dyed cotton cloth, the style varying according to the particular market for which they were intended. They are usually described as either blue and black, or black. Mainly exported to the Malayan Archipelago.

SALEMPORES, SALAMPOURIES. South India. One of the categories of staple cotton-cloth woven on the Coast, varying widely in quality and price. The usual dimensions were 16 x 1 yard, thus coming between *Morees* (s.v.) and *Longcloth* (s.v.). Exported in large quantities to Europe from 1660 onwards. At first obtained mostly from Golconda, but later also from Madras area.

SALLOWES. Western India, especially Khandesh. Good quality, fine muslin used as turban-cloths, and usually emboidered or brocaded. They were mostly bought in the Burhanpur area and were much in demand in Turkey and North Africa.

1614. '... *sallowe* red and white, very fine, edged with gold at the end, yard broad ...'—Factory Records Misc., vol. 25, 56.

SANNOES, SANNAS. North-east India. Plain cotton cloth of ordinary quality, woven chiefly in Orissa, and exported to Europe in large quantities after 1640.

SARASSA. South India. Possibly from Hindi *sarasa*, 'superior.' A patterned cloth much in demand in the Malay Archipelago as a waist-cloth, and in Japan for other uses. The pattern could be either painted or woven, and as there is occasional reference to *sarassa patolas* (s.v. *patola*) it could be either cotton or silk. The word appears to have been used as the generic term for a sort of unsewn garment, rather than as an indication of style or pattern.

c. 1583. 'They likewise make clothes thereof for women to put about them from their navels downwards, bound about their bodies, which they wear within the house, very finely made, the best sort are named clothes of *Sarasso*, some being mingled with threads of gold and silver and such like stuff of a thousand sorts very beautiful to behold.'

Linschoten, *Voyage*, I, 91.

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SAUERGENTES. Probably the same as *Sacerguntes* (see above).

SAURUNCHERAS. See under Sacerguntes.

SEERBANDS. North-east India. Hindi *sirband.* 'turban.' Exported to London as fine muslin. Woven in Dacca District.

1708. "*Seerbands*, 1,000 pieces, if to be gotten finely joyn'd or as the natives call it, Ruffagur'd, so as not to be easily discerned, otherwise send none. We are told the best come from Soonarguan [Sonagaon, Dacca District]."

Letter Bk. XIII, 279.

SEERHAUDCONNAES. North-east India. Plain cotton cloth of ordinary quality, sometimes classed with *Nansooks* (s.v.).

SEERSUCKERS. North-east India. Striped fabric of mixed silk-and-cotton, woven in the Malda-Kasimbazar area. The word has been assimilated into the English language in the sense of a striped cotton fabric with a crapy surface. The O.E.D. traces the word to Persian *shīr o shakkar* lit., 'milk and sugar.' Exported to England from the end of the century. Hobson-Jobson (p. 708) suggests *sir*, 'head,' *sukh*, 'pleasure.'

1709. "*Seersuckers*, the thick sort 12 yds. × $\frac{7}{8}$th yd., instead of being striped with straw-coloured silk, get them striped with pink, blue, gold and other light colours."

Letter Bk. XIII, p. 674.

SEMIANOES. After Samana, in Patiala. Good plain calico, especially liked for its breadth, which was sometimes as much as $1\frac{1}{2}$ yds. Because of the size, they were especially saleable in England.

1626. '. . . broad calicoes called *Semianoes*, being 12 yds. long, but almost $1\frac{1}{2}$ yds. broad.'—Court Bk. V, 396.

SERRIBAFFS. Good quality, fine muslin from Khandesh and the Deccan, sometimes dyed red or blue. Exported mainly to the Near East and Mediterranean ports.

1609. '*Serribaff*, a fine slight stuff or cloth whereof the Moors make their Cabayes or clothing . . .'—*Letters Received*, I, 29.

1611. 'This city [Burhanpur] doth abound in the making of . . . *serebafts* . . .'—Jourdain. *Journal*, 143.

SERYAS, SERIJAS, SEARES, etc. Western India. A cheap strong calico, either plain or striped. In demand in Europe for making napkins, and sometimes flags and sailcloth.

SHASH. Especially Western India. Arabic *shash*, muslin. A generic term for muslin turban-cloths, usually of fine quality, and sometimes embroidered or brocaded. In great demand for Turkey and North Africa. Mostly woven in the Deccan.

1618. 'Their heads are continually covered with a long thin wreath of cloth, white or coloured, which goes many times about them; they call it a *shash*.'—Terry, *Early travels*, 308.

SOUSAES. SOOSIES. Hindi *susi*. Striped or chequered fabric of silk or mixed cotton-and-silk, woven chiefly in the Malda-Kasimbazar area, but also available in other parts of India (e.g. Gujarat) under the same name. They were usually about 1 yard in breadth, and varied from 10 to 20 yards in length. Much in demand in England at the turn of the century.

1716. Ordered for London: "*Sooseys* of 20 × 1 yd., 8,000 pieces small stripes, and 14 or 15 White and Black stripes in each bale. 2,000 pieces small stripes of 25 × $\frac{7}{8}$th yd. . . . 500 Chequered Sooseys."

Letter Bk. XVI, p. 8.

TAFFATIE, TAFFETY. A trade term for silk piece-goods, introduced into Bengal by Europeans who found the Persian term *tāfta* already in use and applied to similar materials (e.g. fine glossy Chinese silks). The European medieval term 'taffeta' had been applied at different times to different varieties of fine fabric, but probably derived

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ultimately from the Persian source—i.e. *tāfta*, ' a glossy twist '.

TANJEEBS, TUNZEBS, North-east India. Persian *tanzeb*, ' body-adorning '. Plain cotton cloth, usually of superior quality and comprising one of the staple commodities of Bengal. Woven chiefly in Dacca District and exported in large quantities to England at the end of the century. Sometimes embroidered with silks in chain-stitch on special order and sold in England for petticoats, dress material, etc.

1707. " Plain muslin . . . fine close struck cloth such as . . . *Tanjeebs*."

Letter Bk. XIII, p. 104.

1723. Ordered for London: "*Tanjeebs* flowered with Silk in Chain Stitch, the closer struck the better . . . 500 pieces for £1,000."

Letter Bk. XIX, p. 78.

TAPPE, TAPICHINDAES. Western India. From Javanese *tapih*, ' skirt ', and Hindi *chint*, ' chintz '. This term indicates a type of garment rather than a particular material. The two main categories were painted cotton (*tapichindae*) and *ikat*-weave (*tappe patola*—s.v. *patola*). Gujarat specialised in these goods and it was considered that they could not be satisfactorily imitated in other parts of India. Exported to Malay Archipelago.

TAPSEELS, TOPSEILES, TAFFICILAS, etc. Western India. Persian *tafcilab* (?). A cheap striped cloth of mixed silk-and-cotton, patterned in the loom, much in demand by the slave traders, and also in the Malay Archipelago. Woven in the Cambay-Ahmedabad area and Sind.

1614. ' . . . tapseels, a striped stuff with silk and cotton . . . ' Factory Records Misc., vol. 25, 56.

TERRINDAMS, TURUNDAMS. Bengal. Plain muslin, usually of superior quality, woven chiefly in Dacca District. Exported in small quantities. In the 19th c., Taylor (*Cotton Manufactures of Dacca*, 46) wrote: " '*Turundam*' said by the weavers to mean ' a kind of cloth for the body ', the name being derived from the Arabic word *turuh* (*tarh*, *tarah*), ' a kind ', and the Persian *undam* (*andiam*), ' the body ' . . . " Dr Moti Chandra has suggested an alternative possible derivation from Persian *darand*, ' fashion, mode, quality ', and *amma*, ' universal ', implying ' a stuff in general fashion '. He also identifies it with *darandama*, mentioned as a royal present in the Rajatarangini, which is less plausible both on the grounds of pronunciation and its doubtful suitability as a royal present to boast of.

TSEHEN. See under SAHANS.

TUCKERYES, TUCKREES. Bihar Striped silk piecegoods woven at Baikanthpur, ten miles East of Patna, and sometimes known as *Becutpoorees*. They were probably very similar to *Alachas* (s.v.).

1632. " *Tuckrees* or *Becutpoorees*, a thin silke stripte stuffe 4 coveds long and ⅞th broad . . . "

Mundy, *Travels*, II, p. 155.

TUSSUR, TUSSER, TUSSORE, etc. North-east India, especially Bengal. Hindi *tasar*. Silk produced from the wild silk-worm *Antheraea paphia*. The characteristic colour of Tussur-cloth was a yellow less bright and glossy than the Assam wild silk known as *Muga* (s.v.) with which it was sometimes confused. Both wild silks were wrongly thought by European merchants to have been " spun from a herb ", hence also called Herba (s.v.). Tussur was much used in the making of mixed cotton-and-silk fabrics such as *Ginghams*, *Nillaes*, etc.

YECKANDAMES. See under JECKANDAMES.

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PART TWO

P. R. SCHWARTZ

FRENCH DOCUMENTS ON INDIAN COTTON PAINTING

Chapter I. The Beaulieu Manuscript, c. 1734.
Chapter II. New light on old material.
Appendix A. The Letters of Father Coeurdoux, 1742 and 1747.
Appendix B. Anonymous report, 1752.
Appendix C. Cotton printing in India : some concluding remarks.

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CHAPTER I

The Beaulieu Ms. C. 1734

WHILE investigating the history of French cotton-printing in the eighteenth century, I became aware of the possibility that there existed somewhere in France a document of unique importance for the study of methods traditionally employed in India. How the existence of this document came to be sought, and how it was eventually found, are closely involved with the history of the Ms. itself, and for this reason the circumstances are worth telling in some detail.

One of the earliest indications of its existence appears in a famous treatise on cotton-painting by the well-known Basle manufacturer, Jean Ryhiner (1728-1790).[1] This work, which was written in 1766, includes a penetrating analysis (the first known to have been written by anybody in the trade) of Indian methods, which the author claimed to have based on two sources : on the one hand, the now famous letter of the Jesuit Father Coeurdoux written in 1742 ;[2] and on the other, " *le Chapitre Ier, de la Méthode des Indiens, selon le rapport de M. de Beaulieu à M. Dufay, de Pondichéry* (the first chapter of the method practised by the Indians, according to the account given by M. de Beaulieu to M. Dufay, from Pondicherry)."

There is no evidence that the second source had been published anywhere at that time under such a title ;[3] but in 1760—six years before Ryhiner wrote

[1] Jean Ryhiner, *Traité sur la fabrication et le commerce des toiles peintes*, written in 1766, published only in 1865. The original Ms. is owned by the Société Industrielle de Mulhouse, Mulhouse, France. Cf. Bulletin de la Société Industrielle de Mulhouse, no. 3, 1950, pp. 23 and 36 (n.3), no. 2, 1953, pp. 64 and 73 (n.6).

[2] *Lettres édifiantes des Pères de la Mission*, vol. 26, Paris, 1743. This letter is published in English translation by G. P. Baker, *Calico painting and printing in the East Indies*, London, 1921, pp. 11-16. I hope to present a revised translation and commentary with my next article, to appear in this journal next year.

[3] A summary of Beaulieu's text is given in the preface of a work published in Paris, 1800. The author (anonymous) writes : "The (Indian) process was described in 1736 by Beaulieu, a ship's captain. He had been commissioned by Dufay, etc. . . ." I do not know where the date 1736 came from. Considering the movements of the naval officer in question it would be more likely to be 1735 or even 1734. The summary contains one inaccuracy: the author writes of three madder baths, whereas the narrator in fact only mentioned two. I draw attention to this error because it recurs in a recent work by our late and lamented Bernard Roy, *Une capitale de L'indiennage : Nantes*, published in that town in 1948, who reprinted the text of 1800 as something new, not knowing the contents of Quérelles' treatise of 1760. The 1800 publication is entitled, *l' Art de peindre et d'imprimer les toiles et grand et en petit teint*, by B . . . On the line below are the initials A.J.D.M. The author appears to have remained anonymous. We found no mention of him either by Barbier or by Quérard. Certain historians of cotton painting and some bibliographers identify "B" with Beaulieu, because that name occurs in the introduction. Obviously it cannot refer to the naval officer of that name as he died in 1764, thirty-six years before publication of the treatise which, moreover, describes French manufacture and technique in use at

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his treatise—it had appeared in a treatise on cotton-painting by Chevalier de Quérelles.[1] In the latter, Quérelles gave the following information: "M. Dufay (we retain the original spelling) was kind enough to describe the methods used to make painted cottons in India; M. de Beaulieu, a naval officer, had made a study of them there and had given him an account." Further on in the same context, M. Dufay is quoted by Quérelles as saying: "M. de Beaulieu at my instigation made a thorough study of everything connected with the production of painted cottons and he acquitted himself of the task with great accuracy and intelligence; he had a piece of cotton painted in his presence and not only did he give a minute account of the whole process but [my italics, P.R.S.] *after each stage of the proceedings cut off a piece from the cloth which he brought back with him together with samples of all the materials used in the process*. I shall give a detailed description of this: After his return M. de Beaulieu took the trouble to repeat the whole procedure in front of me with the materials he had brought back, and he was completely successful: we can thus be perfectly satisfied as to the accuracy of what I am about to report. . . ."

It seemed obvious to me that the M. Dufay in question must have been the famous colour chemist of that name who died in 1739. Therefore, there must have existed—and perhaps still exist somewhere—sample fabrics of an earlier date showing successive stages in the production of Indian painted cottons. If still existing, then it seemed at the time that the chances of recovering them were slender—until my friend and Paris correspondent M. Paul Leuilliot[2] who had been informed of the matter, remembered something of the kind having appeared in a temporary exhibition[3] at the Bibliothèque Nationale, Paris, in 1931. Under

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the end of the eighteenth century, and mentions also in the bibliography works published 1760-1799, including the above-mentioned one by Quérelles.

[1] Chevalier de Quérelles, *Traité sur les toiles peintes*, Paris, 1760. Cf. Bulletin de la Société Industrielle de Mulhouse, Mulhouse, France, no. 2, 1953, pp. 67, 68 and 76 (n. 16). We find in this treatise "chapter one, On the method of producing painted cotton in India." So far nothing is known of the author's cotton painting talents beyond the information he himself gives in the preface of his book. "I made for Madame la Marquise de Fervaques in Paris a hanging eleven feet high (1 French foot 32.48 cm. = 3.5728 m.) representing a garden where the Emperor of China is placed under a beautiful pavilion, surrounded by guards etc . . . This piece is worth to be seen by connoisseurs, they know how difficult it is to execute such a work". A Fervaques mansion, dating from the 17th century, was demolished in the 19th century when the Rue du Louvre was pierced in Paris. There seems to be no trace of an inventory of the furniture. In answer to a question inserted in a Paris publication *Intermédiaire des Chercheurs et Curieux*, three replies were received, July 1955, January and August 1956. It appears from them that the family originates from Languedoc, southern France, and that a certain number of Quérelles and Quérel lived at Montpellier, military men and magistrates. Besides his work on cotton painting and printing, Quérelles published a *Treatise on fortifications*, Paris, 1745 and 1749, and in 1772 a project concerning a military establishment. We saw already that he was acquainted with Du Fay the chemist. Now, I discovered that an abbot Du Fay published in 1707 a method of fortification, but do not know if these two Du Fay belonged to the same family. A Quérelles lodged the future Napoleon III in Strasbourg, when preparing his political stratagem in this town in 1836.

[2] Member of the Société Industrielle de Mulhouse: Director of Studies of the 6th section of the École pratique des Hautes Études (Sorbonne), and a specialist on the industrial and economic history of Alsace.

[3] The exhibition was devoted to material bearing upon French possessions abroad.

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item No. 232 of the catalogue (of which he retained a copy) appeared Ms. entitled *Manière de fabriquer les toiles peintes dans l'Inde, telle que M. de Beaulieu, capitaine de vaisseau, l'a fait exécuter devant lui à Pondichéry (XVIIIème siècle).*" Fortunately the description following the title—the author of which certainly knew nothing about cotton painting—began with the information that " several specimens of painted cotton are attached to this little Ms." All that remained was for me to visit the library which lent the Ms. to the exhibition (the library of the Muséum National d'Histoire Naturelle, Paris) and there see for myself, in the department of manuscripts, a slim notebook in excellent condition, with twelve pages of text and eleven sample fabrics of cloth, the average size of which was about 14. 60 x 11.20 cm.—the vitally important work on the history of cotton painting for which I had been searching.[1]

A comparison of the text of the above notebook with that by Chevalier de Quérelles shows that the latter must have had before him additional information supplied by M. Dufay (or else he added his own personal comments). As these are sometimes of interest in themselves, we are including them in the form of footnotes to the Beaulieu text.

The Muséum document does not bear a date, but it must have originated before the death, in 1739, of Charles-Francois Du Fay de Cisternay, who was born in 1698 and was official Inspector of Dye-Works and Mines, and Inspector of the Botanical Gardens in Paris—one of the great French colour chemists of the eighteenth century.[2] We are thus in possession of the earliest accurate technical description of a known method of producing painted cottons, and moreover the only one which has come down to us complete with patterns, which greatly enhances its value. The second detailed description, which has already been mentioned and is well known to students of the subject, is the letter of the Jesuit Father Coeurdoux, dated 18th January, 1742, also based on investigations at Pondicherry.

It seems almost certain that the author of the Ms. can be identified with Antoine Georges Nicolas Henri de Beaulieu (son of Jacques) of St. Malo, residing in Paris, born between 12th March and 24th May, 1699, died 24th May, 1764 at Lorient, husband of Louise Thérèse Charlotte Groux.[3] He was employed by the Compagnie des Indes, was midshipman in 1722, and between 1726 and 1739 stayed five times at Pondicherry—on one occasion (in the course of his third voyage) from 29th July until 27th September, 1734, as 2nd Lieutenant of the ship *Maurepas*. This ship, which returned to France on 8th April, 1735, was commanded by Captain Jacques Du Fay (son of Antoine), of Paris, at that time

[1] Thanks to the kindness of Mme. Duprat, Director of the Library and of Mlle. M. G. Madier, Librarian, I was able to have the document specially photographed at the Victoria and Albert Museum, London. My grateful thanks are due also to Mr. John Irwin of that museum for supervising the translation of both the Beaulieu Ms. and this article into English.

[2] *Cf., Les grands maitres de l'art de la teinture en France au XVIIIe siècle*, Les Cahiers Ciba, Basle, vol. I, no. 2, 1946.

[3] From information kindly supplied by Mlle. G. Beauchesne, Archivist of the 3ème Arrondissement maritime at Lorient (Morbihan), France, on 13th June, 1953.

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44 years of age. (This coincidence of names is striking and, if a close relationship could be established between Du Fay the naval officer and Du Fay the chemist, this would afford a simple explanation of Beaulieu's mission.) Beaulieu was to visit India again on 9th February, 1736, returning on 20th October, 1739. Appointed Captain in 1743, he does not seem to have travelled after promotion and his name disappears from the lists of the Compagnie des Indes after 1744.[1]

Mlle. M. G. Madier, Librarian at the Museum where the Ms. was found, was kind enough to give me the following additional information of great value :

" The Muséum really owns two Beaulieu manuscripts—Ms. 193[1] and 193[2]—but only the former contains patterns. They are not by the same hand. Moreover, neither is in the handwriting of Du Fay which is known from specimens of his signature in the library of the Académie des Sciences, as the secretary-archivist, M. Gauja, has shown. On the other hand it is very probable that Ms. 193[2] was written by the famous botanist, Bernard de Jussieu, whose handwriting is similar.[2] Ms. 193[1] and 193[2] (the texts are identical) were acquired at the sale of the Jussieu library in 1858, five years after the death of Adrien de Jussieu,[3] who was thus the last owner of the documents before they were acquired by the Muséum."

I saw in the Library a third copy, which is not mentioned in the catalogue published for the Mss, but will appear in the next edition. The origin and the date of purchase remain unfortunately completely unknown. It bears the stamp of Halliwell-Philipps (1820-1889), a distinguished English collector, whose main interest appears to have been principally early English literature. So far no other informations are available regarding this document.

It must be assumed that men of science who were at that time interested in problems of dyeing and cotton-painting either copied out the Beaulieu text themselves or had it copied,[4] since the ban on cotton-printing in France (which was not lifted until 1759) would have made in difficult for Du Fay—an official of the administration—to have it printed.

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1 Quérelles speaks only of a " naval officer," whereas the Muséum Ms. states explicitly " ship's captain "—a rank that Beaulieu did not obtain until after Du Fay's death. Unless the title is a courtesy one, we must conclude that the Ms. is a copy made after Beaulieu's promotion.

2 A Ms. entitled *Mémoire Couzier*, known to be in the handwriting of Bernard de Jussieu, is preserved in the same Muséum library.

3 Adrien de Jussieu, great nephew of the two brothers of that name, celebrated botanists Antoine (1686-1758) and Bernard (1699-1777), the latter an exact contemporary of Du Fay and Beaulieu. We know from an undated Ms. belonging to the museum library that one of the Jussieu brothers received from Pondicherry (from a Dr. Couzier) various chemicals, thirteen in all, for red and blue dyeing, including chay roots, mirobolans, redwood, indigo, etc. A doctor of the name Couzier is mentioned in a work of 1722, according to information kindly supplied by Mlle. M. G. Madier of the Muséum library.

4 The number of Ms. copies with samples might have amounted to about 45 if we take the following facts into account : Beaulieu had a piece of cloth 6 aunes in length painted in his presence. We can assume that this was in Paris aunes of about 1.188 m. We thus have, in round figures, 7.20 m. of raw material. The width is not indicated but we can make an arbitrary assumption, based on widths of cloth common in India, that it would be at most 7/8th of a Paris aune, i.e. 1.05 m. After each operation Beaulieu had a piece of half an aune cut off, which would

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The following is the full text of the Beaulieu Ms. according to version 1931, now published for the first time. Where appropriate, spellings have been modernised and punctuation added. As already explained, the additional comments attributed to Dufay by Quérelles in his treatise of 1760 are printed here as footnotes. The numbering of the stages of the process is mine.

Manière de fabriquer les toiles peintes dans l'Inde telle que M. de Beaulieu Capitaine de Vaisseau l'a fait exécuter devant lui a Pondichéry.

* * * * *

Method of producing painted cottons in India as demonstrated to M. de Beaulieu, ship's captain, at Pondicherry.

I

L'ouvrier a pris 6 aunes de toile de coton écrue qu'il a fait blanchir sans eau de riz ni de chaux quoique cela se pratique ordinairement pour les toiles blanches ordinaires.

Il a fait piler dans un mortier 30 grains de mirabolans (5 par aune) il les a délayés et bien mêlés dans 2 pots d'eau, il a passé par un ligne cette eau dans laquelle il a trempé et bien frotté la toile, et l' a laissé infuser pendant la nuit.

Le lendemain matin il a mis le vase qui contenait la toile et la liqueur sur le feu et l' y a laissé bouillir pendant une bonne demie heure, puis il l' a retirée et laissé refroidir ensuite il l' a frottée et battue, enfin il l' a lavée dans l' eau claire et l' a fait sécher.

Il a pilé de nouveau 30 grains de mirabolans qu'il faut arroser d'un peu d'eau pendant qu'on les pile et les ayant réduits en consistance de pâte il les a délayés dans 2 serres de lait de buffle, il a passé cette composition par un linge et a délaye les parties de mirabolans qui étaient restées dans le linge dans 3 serres d' eau qu' il a mêlées dans les 2 serres de lait.

La toile étant sèche il l' a lavée dans ce mélange et l' ayant frottée exprimée et relavée 3 fois, il l' a battue et fait sécher, et etant sèche elle est devenue couleur de citron comme l' on voit dans le morceau No. 1. Il a ensuite battu la toile sur un billot de bois très dur et poli avec des pilons d'environ 15 pouces et dont le gros bout en a 6 à 7 de diamétre : c'est là toute la préparation qu' il a donnée à la toile, qu'il a ensuite poncée avec du charbon pilé après l' avoir étendue sur une table.

Il a mis dans de l' écorce de riz 1 livre de pierres vitrioliques (j' en ai) et les ayant bien couvertes il a jeté dessus quelques charbons ardents, le feu a pris à l' écorce de riz qu' il a laissé consommer ce qui a duré 2 bonnes heures, lorsque les pierres ont été refroidies il les a mises dans 2 serres de Chouris (c' est une liqueur qu'on tire par incision du tronc

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give us a piece of about 60 x 105 cm. (I am ignoring shrinkage due to handling of material.) If we assume the samples to be the same as the Muséum Ms.—that is, c. 14.60 x 11.20 cm.—it would have been possible to furnish about 45 notebooks of the same size. This is the maximum number because smaller patterns would have been of little use for the text.

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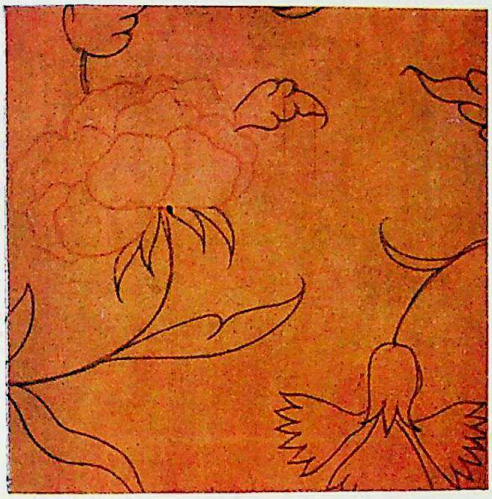
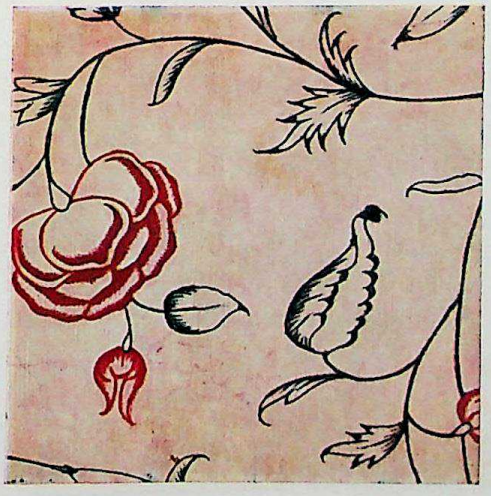
Specimens of successive stages of cotton-painting attached to the Beaulieu ms.



1 Shows the yellowish colour of the cloth due to the preparation, the drawing of the lines with iron mordant (giving black with the myrobolan) and aluminium mordant slightly red tinted.

2 Shows the effect of the first maddering. The red and black lines get much darker.



3 Shows the bleaching effect of the dung bath.

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4 Shows the small wax lines producing a subsequent resist effect in the leaf.

5 Shows the wax resist (not white but blue as already used for indigo dyeing).

6 Shows the unresisted places dyed blue. An unwished blue spot caused by cracking of the wax appears near the big red flower.

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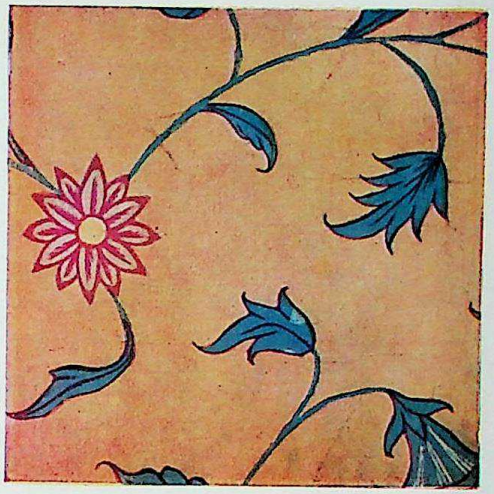
7 Shows hatchings of aluminium mordant or molten wax to produce red or white effects.



8 Shows the surface of the design painted with curcuma and aluminium mordant, and diluted iron mordant.

9 Shows effect of the second maddering (engendering new colours).

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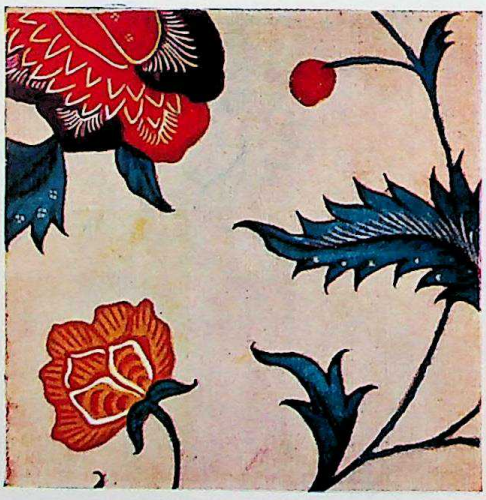
10 Shows bleaching effect of the dung bath.



11 Shows the cloth ready for sale with all the wanted colours after putting of the yellow, which gives green or blue.

Note on plates: The imperfections of modern colour reproduction have unfortunately resulted in some distortions. For example, no. 4 shows red lines in the leaf instead of white ones. No. 8 does not make clear what I wanted to illustrate because the original sample is not completely reproduced. Nos. 9 and 10 show hardly any difference in ground, so that the bleaching effect of the dung-bath is not perceptible. In no. 11 green is hardly discernible. Moreover, left and right have been confounded in reproduction: in order to see the samples as they are in reality one would have to use a mirror. P.R.S.

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des cocotiers) et les y a laissées pendant 3 jours, les exposant pendant le jour au soleil et les couvrant pendant la nuit. Il a tracé avec cette liqueur tous les endroits qui doivent être bleus verts ou violets dans la toile.

Il a fait bouillir 4 onces de bois du Japon dans 1 serre d'eau jusqu' a réduction de moitié ou environ, et en relevant cette liqueur de dessus le feu il y a jeté un once d' alun. C'est avec cette liqueur qu' il a tracé tout ce qui devait être rouge dans la pièce.

Avec ces mêmes liqueurs il a ombré tout ce qui devait l'être tant en rouge qu'en noir.' C'est après ce travail que le morceau dessous a été coupé (Plate A, No. 1).

The workman took 6 aunes of raw cotton cloth which he bleached without using either rice-water or lime, although these are customary when bleaching ordinary cloth.

He ground 30 grains of mirabolans in a mortar (5 per aune), diluted and mixed them well in 2 potfuls of water ; he strained the water, steeped and rubbed the cloth in it, and then left the cloth to soak during the night.

Next morning he put the vessel containing the cloth and liquor on a stove and allowed it to boil for a good half hour, after which he removed it and let it cool, and then rubbed and beat it ; finally he washed it in fresh water and left it to dry.

He ground another 30 grains of mirabolans, which must be moistened with a little water while ground, and when these had formed a paste he diluted them with two sers of buffalo milk, he strained this mixture through a piece of calico and washed the residue of mirabolans in 3 sers of water which he then mixed with the 2 sers of milk.

When the cloth was dry he washed it in this liquor and after rubbing it, squeezing it out and re-washing it three times, he beat it and let it dry ; and after it was dry it took on a lemon yellow colour as can be seen in specimen No. 1 (Plate A). He then beat the cloth on a block of very hard polished wood with pestles of about 15 inches, the wide end having a diameter of some 6 or 7 inches : this was all the treatment the cotton received, and he then spread it on a table and pounced the design with crushed charcoal.

He next covered 1 livre of vitriolic stones (I have some) with husks of rice and threw glowing charcoal over them. The husks caught fire and he allowed them to burn away, which took a good two hours ; when the stones had cooled he put them in 2 sers of Chouris (this is a liquid that is tapped from the trunks of cocoanut trees) and left them there for three days, exposing them to the sun during the day and covering them up at night. He used this liquid to trace out all the parts that were to be blue, green or violet on the cloth.

He boiled 4 ounces of Sapan wood in 1 ser of water until about half had boiled away, and removing the liquor from the fire he added one ounce of alum. He used this liquor to trace out the parts that were to be red in the cloth.

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With these liquors he shaded all the parts that had to be shaded, whether red or black.[1] It was after this process that he cut the piece attached below (Plate A, Specimen No. 1).

II

Il a lavé la toile dans l' eau et l' a fait sécher. Il a pilé une livre et demie de Raye de Chaye et l' ayant bien pulvérisée il l' a mise dans 3 pots d' eau, il y a plongé la toile qui était encore un peu humide et l' a fait bouillir à feu modéré pendant 2 heures ayant attention de remuer souvent la toile, il a retiré le vase et a laissé la toile dans le bain jusqu' à ce qu' il fut refroidi, puis il l' a retirée, l' a lavie dans l' eau fraiche et l' a fait séchér.[2]

C'est après cette opération que le 2ème morceau a été coupé. Na La Raye de Chaye m' est connue, mais on peut lui substituer la garance ou Kermès ou la Cochenille.

He washed the cloth in water and dried it. He ground 1½ livres of chay-root, and when it was well pulverized he put it in 3 potfuls of water; he immersed the cloth, still slightly damp, and boiled it over a moderate fire for 2 hours, taking care to stir the cloth frequently. He took the vessel off the fire and left the cloth in the bath until it was cold, then removed and washed it in fresh water and dried it.[2]

The 2nd piece was cut after this operation. *Note:* Chay-root is known to me, but madder, kermes or cochineal can be used instead.

III

Pour faire perdre au fond de la toile la couleur sale qu'elle avait contractée par l' opération précédente, il a délayé 3 livres de fiente de cabri dans 4 pots d'eau, une heure après il a mis la toile dedans et l' y a laissée pendant la nuit, le lendemain matin il l' a bien exprimée et étendue sur les bords d' un étang et il jetait de temps en temps un peu d' eau dessus pour l' entretenir humide. Il l' a fait tremper le soir dans de l' eau comme la veille et l' y laissa pendant la nuit. Le lendemain il l' a exposée et arrosée sur le bord de l' étang. Il a recommencé cette même opération une troisième fois et sur la fin du jour il l' a laissé sécher entièrement, l' a lavée dans l' étang et l' a fait sécher. Cette opération a blanchi le fond comme on le voit dans le 3ème morceau ci-accosté.[3]

To remove the rather dirty colour acquired by the ground during the preceding operation he soaked 3 livres of kid dung in 4 potfuls of water. One hour later he immersed the cloth in the liquor and left it overnight; the next morning he

[1] Du Fay commented according to Quérelles: "For it should be noted that the infusion of vitriolic stones turns black on cloth prepared with Mirabolan. In order to draw the lines he used a kind of pen made of two blades of reed pressed together and attached to a little handle, about as thick as an ordinary pen. After this preparation M. de Beaulieu cut off another half-aune of cloth, which he brought back to me and which I am keeping in this state: it is yellowish, as I have already said, and the outlines and shadows of the stalks and leaves and of some of the flowers are a rather unpleasant pale red, but we shall soon see that this red does not remain and that it only serves as a foundation for the other [Plate A]."

[2] Du Fay commented according to Quérelles: "M. de Beaulieu then cut a second ½-aune of cloth so as to preserve it in that state. The ground is a little greyer and darker than in the first piece, the black lines are more intense and the ones that were pale red after the first operation are now a very dark, rather vivid, red [Plate A]."

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squeezed it out well and spread it on the edge of a pond, sprinkling it with a little water from time to time to keep it damp. In the evening he again immersed it in water as before and left it overnight. The next day he laid it out on the edge of the pond and sprinkled it. He repeated the operation a third time and towards evening let it dry completely, then washed it in the pond and dried it. This process bleached the ground as can be seen in the adjoining 3rd piece (Plate A).[1]

IV

Il a ensuite lavé la toile dans une eau de riz claire et l' a fait sécher et étant séchée il l' a battue sur un tronc d' arbre comme on a dit ci-devant.

Il a tracé ensuite avec de la cire fondue les petites lignes qui servent à panacher les fleurs qui sont destinées à être teintes en bleu et ou il doit y avoir des réservés blanc. Il se sert pour cela d' une plume de fer faite exprès dont une partie est garnie d' un morceau de toile.[2] *C' est après cette opération qu' on a coupé le 4ème morceau.*

Next he washed the cloth in clear rice-water, dried it, and when it was dry beat it against a tree-trunk, as has already been described.

He then traced with molten wax all the tiny lines that were to remain white on the blue part of the flowers. For the purpose he used a specially prepared iron pen, one part of which is covered with a piece of cloth.[2] When he had finished this the fourth piece was cut off (Plate B, Specimen No. 4).

V

Il s' estdensuite servi de la même plume pour border avec de la cire fondue tout le dessin et avec un pinceau il a couvert de la même cire le fond de la toile et tout ce qui ne doit être ni bleu ni vert dans l' ouvrage ainsi qu' on le voit No. 5

Il ne s' est point servi de pinceau mais une espèce de bouchon de toile ajusté au bout d' un petit bâton.[3]

He used the same pen to outline the whole drawing with molten wax, and then, using the same wax and a pencil covered the whole ground of the cloth and all the parts that were not to be either blue or green, as we can see in No. 5 (Plate B).

He did not use a brush but a kind of wad of cloth fitted to the end of a small stick.[3]

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[1] Du Fay commented according to Quérelles : " M. de Beaulieu preserved a third piece in this state ; it resembles the preceding one in every respect, except for the ground which is almost white with only a slight touch of yellow in certain parts, and the fact that the red is a little more vivid [Plate A]."

[2] Du Fay commented according to Quérelles : " M. de Beaulieu brought back several such pens, as well as other ones which I have already described, and half an aune of the cloth after the operation ; it hardly differs from the other piece, except that on close observation, or looked at against the light, small wax lines can be seen [Plate B]."

[3] Du Fay commented according to Quérelles : " He (the workman) used a cotton pad for this last operation which we have just described. I also have a piece of cloth in this state : it is entirely covered with wax that seems brown or very dark white blue. This wax is blue because the workmen continue using it as long as possible for the sake of economy. The first time they use it it is as white as ours." [Plate B].

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VI

Il a plié la toile en plié de 4 pouces ou environ et après l' avoir un peu pressée il l' a trempée plusieurs fois de suite dans une jarre de liqueur propre à teindre en bleu, et ayant étendu la toile il a appliqué de cette liqueur sur les endroits qu' il a jugé n' en avoir pas assez pris, ensuite il a étendu la toile à l' ombre pour la faire sécher.

Il a enlevé la cire sur la toile en la plongeant plusieurs fois dans l' eau chaude et changeant l' eau de temps en temps. La cire étant détachée il a donné à la toile 3 lessives avec l' eau et la fiente de cabri et l' exposant tous les jours au soleil en l' arrosant comme il a été dit dans l' article de la 3ème préparation. Il l' a ensuite fait sécher et en a coupé le 6ème morceau.[1]

He folded the cloth into pleats of about 4 inches and after pressing it lightly dipped it several times in succession into a jar of liquid blue dye; and after spreading out the cloth he applied the liquid to the parts that in his opinion had not taken sufficiently; next he spread out the cloth in the shade and let it dry.

He removed the wax by immersing the cloth several times in hot water, changing the water from time to time. When the wax had been removed he washed the cloth three times in water mixed with kid-dung, exposing it to the sun each day and sprinkling it in the manner described for the 3rd stage of the preparation. He next dried it out and cut the 6th piece (Plate B).[1]

VII

Il a trempé pendant une demie heure la toile dans un pot d'eau mêlée avec un peu de lait de buffle et l' ayant fait sécher il l' a battue sur un tronc d' arbre.

Pour panacher les fleurs il a tiré de petits traits dont ceux qui doivent être blancs ont été faits avec de la cire fondue, ceux qui doivent être rouges avec de la liqueur faite avec le bois de Japon et ceux qui doivent être bleus ou verts d' abord avec du Chouris et ensuite avec de la liqueur propre à teindre en bleu.

C' est alors qu' on a coupé le 7éme morceau.

Il n' y a point dans ce dessin de ces traits bleus ou verts.[2]

He soaked the cloth for half an hour in a bowl of water mixed with a little buffalo milk, and after he had dried it he beat it against a tree-trunk.

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1 Du Fay commented according to Quérelles: " M. de Beaulieu had a sixth piece cut off. The white ground is not very bright, the stalks of the leaves that had been left uncovered are blue; the rest is unchanged because the wax had protected it. On some parts of the ground, however, blue spots are visible, caused by the cracking of small particles of the molten wax, or else because it had not been supplied with sufficient care [Plate B]."

2 This part of the text is incomprehensible. Technically, it is impossible to set blue or green lines in the design if the method described here is employed, and there must be some confusion either in the original manuscript or in the copying. The version given by Quérelles, which is undoubtedly the correct one, is as follows: " It was only a question of streaking with a lighter red the flowers that were to be yellow and those that were to be violet with white; he drew little lines or hatchings with a solution of alum and Sapan wood to colour the former, and with molten wax to colour the latter. M. de Beaulieu then cut the seventh piece, which differs only from the preceding one by those little hatchings [Plate B]."

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To streak the flowers with different colours he drew small lines, the ones to be white were done with molten wax, the ones to be red with liquor made from Sapan wood and the ones to be blue or green first with Chouris and then with liquid blue dye.

At that point the 7th piece was cut (Plate C).

This drawing shows no traces of blue or green.[1]

VIII

Il mit dans 8 *serres d' eau une once un gros d' alun, même quantité de Terra merita qu' il avait détrempé auparavant et passé sur la pierre et l' ayant laissé infuser pendant une nuit, il a enduit avec cette liqueur tout ce qui doit être d' un rouge jaunâtre ou jaune. Il a mêlé une serre de la liqueur faite avec les pierres vitrioliques dans* 10 *serres de Cange aigre (c' est de l' eau de riz qu' on a laissée* 10 *jours à l' air). Ayant laissé reposer ce mélange durant une nuit il s' en est servi pour enduire les endroits que l' on voit bruns dans le* 8*ème morceau, il a lavé la toile et l' a fait sécher.*[2] *C'est alors qu' on a coupé le* 8*ème morceau ci-contre.*

He put 1⅛ ounce of alum into 8 sers of water, an equal quantity of *Terra merita* which he had previously diluted and reduced on a stone, and after leaving it overnight he covered all the parts that were to be yellowish red or yellow with the liquor. He mixed one ser of liquor made from vitriolic stones with 10 sers of acid Congee (i.e. rice-water that has been exposed to the air for 10 days). After allowing the liquid to settle overnight he used it to cover the parts which appear brown on the 8th piece, he washed the cloth and allowed it to dry.[2] At that point the 8th piece attached here (Plate C) was cut.

IX

Il a mis 4 *livres de Raye de Chaye dans* 4 *pots d' eau après l' avoir bien pulvérisée et y ayant mis la toile il l' a fait bouillir a très petit feu pendant* 4 *heures ayant attention de remuer la toile qu' il a laissée dans le vase jusqu' a ce que la liqueur ait été refroidie, alors il l' a retirée et l' ayant exprimée il l' a fait sécher.*

Il l' a ensuite lavée, de nouveau fait sécher et comme il y avait des taches en divers endroits il les a otées avec du citron ou avec du fruit de Jambelon.[3]

On a alors coupé le 9*ème morceau.*

He put 4 livres of well-pulverized chay-root into 4 potfuls of water, and when the cloth had been steeped in it he boiled it over a low fire for 4 hours, taking care to stir the cloth, and then left it in the vessel until the liquid was cold ; then he removed it, squeezed it out and dried it.

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[1] See footnote 2, previous page.

[2] Du Fay commented according to Quérelles : " A piece was cut off the cloth: and in this state the parts to be violet are grey-brown, and those that are to be orange are yellow [Plate C]." It would no doubt be possible to use the acid congee instead of mirabolans forty-first preparation of the cloth (see Section I).

[3] Du Fay commented according to Quérelles : " Then the ninth piece was cut, the ground is very like paper that has acquired a reddish tinge from exposure ; the red is far finer than it had been before or than it was to remain, and the parts to be violet are coffee coloured [Plate D]."

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He then washed it, dried it again, and as there were a few stains he removed these with lemon or the fruit of Jambelon.[1] (*Eugenia Jambolana, Lam.*, commonly known as the " black plum.")

The 9th piece was then cut.

X

Il a lavé la toile dans l' eau de fiente de cabri 3 jours consécutifs comme il a été dans la préparation du 3ème morceau et pour emporter toute la couleur roussâtre qu' elle avait contractée dans la Raye de Chaye, et ensuite il l' a lavée et frottée plusieurs fois dans une eau de savon tiède puis dans de l' eau fraiche et l' a fait sécher.[2]

La 10ème morceau fait voir dans quel état la toile était alors.

He washed the cloth in water mixed with kid-dung for three consecutive days after the manner described for the preparation of the 3rd piece, so as to get rid of the rusty colour it had acquired from the chay-root. Next he washed it and rubbed it several times in luke-warm soapy water and then in fresh water and finally allowed it to dry.[2]

The 10th piece shows the condition of the cloth at that stage (Plate D).

XI

Il a lavé la toile dans un pot d'eau mêlé avec un pot de lait de buffle et l' a fait sécher. Il a pulvérisé 8 onces de fleurs de Cadouca et 1 once de grains de mirabolans qu' il a mis tremper pendant 16 heures dans 8 serres d' eau. Ensuite il a jeté dans cette composition 2 onces de Raye de Chaye pulvérisée. Il a fait chauffer cette composition jusqu' a ce qu' elle ait été prête a bouillir et en ayant enduit tout ce qui doit être vert ou jaune, il l' a étendue pour la faire sécher. Il a mis dans 6 pots d' eau 2 livres de fiente de cabri, 2 livres de Chaouroux (c' est un sable terreux et salé qui se trouve sur les bords de la mer) et 1 livre de savon en fort petits morceaux et ayant brouillé cette eau avec un bâton pendant une demie heure il l'a laissé reposer pendant 2 heures.

Il a vidé dans un autre vase ce qu' il y avait de clair de cette eau et le lendemain il a lavé la toile dans cette eau claire, il l' a exprimée ensuite et l' a étendue sur le bord d' un étang de l' eau duquel il l' arrosait de temps en temps, le soir il l' a battue sur une pierre et le lendemain il l' a fait sécher[3] *et la toile est devenue comme on le voit dans le onzième morceau ci-contre.*

He washed the cloth in a solution composed of one potful of water and one of buffalo milk and allowed it to dry. He ground up 8 ounces of Cadouca and 1 ounce of grains of mirabolans which he left to soak for 16 hours in 8 sers of water. Next he added 2 ounces of pulverized chay-root. He heated the mixture

[1] See footnote 3, previous page.

[2] Du Fay commented according to Quérelles : " This treatment brightens all the colours as can be seen in the piece that M. de Beaulieu then cut off, and the ground shows only a faint sulphur yellow [Plate D]."

[3] Du Fay commented according to Quérelles : " This completes the process and nothing remains but to add luster to the surface of the cloth (here follows the description of the process). . . . The cloth we have just been describing is one that involves the longest treatment because it contains all the colours, and it was for that very reason that M. de Beaulieu chose it in preference to others which would only have shown the preparation of two or three colours."

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to just below boiling point and with it covered all the parts that were to be green or yellow, and spread out the cloth to dry. He put 2 livres of kid-dung, 2 livres of Chaouroux (this is a salty, earthy sand found on the sea-shore) and 1 livre of soap cut up into very small pieces into 6 potfuls of water and stirred it with a stick for half an hour, after which he let it settle for two hours.

He strained off the clear water into another vessel and next morning washed the cloth in it, then he squeezed it out and spread it on the edge of a pool, sprinkling it from time to time with water from this pool. In the evening he beat it against a stone, and the next morning dried it,[1] after which the cloth appeared as we see it in the 11th piece (Plate D).

The manuscript transcribed above is not (as we have already mentioned) in Du Fay's handwriting. Moreover, there is no reason to suppose that it is in Beaulieu's. It must therefore be the work of a copyist reproducing a text the author of which it is difficult to determine with certainty. To judge from the notes with which it is elaborated, it could represent a first brief resume made by Du Fay on the observations of his envoy, Beaulieu. As a matter of fact there is, or there must have been, a second more complete version—the one that Du Fay passed on to Quérelles and which the latter mentions in his treatise of 1760. There the error already noted in the 7th operation is rectified. Only the original notes of Beaulieu could explain how it came about.

The operations described by Beaulieu can be summed up schematically as follows :

The raw cloth is first of all half-bleached and prepared with a fatty aqueous solution containing an astringent. In this way, on the one hand, the mordants are prevented from running on the cloth and, on the other, the subsequent development of the colours they engender is assisted during the maddering operation.

The iron mordant is prepared from a natural produce which contains the metal and which is immersed in palm wine which has turned sour. The alum represents the aluminium mordant. These two liquids are applied to the lines of the drawing which had first been pounced on the cloth with crushed charcoal. The iron mordant turns black on contact with the astringent with which the cloth was impregnated. The aluminium mordant, for its part, is lightly tinted red with a concoction of tinctorial wood, so that the workman can follow his work.

The next step is the use of madder-dye, the function of which is to blacken the lines already black, and to develop the reds. Then the cloth is immersed in a dung-bath to remove the temporary red of the ground produced by the madder on parts where mordant had not been applied, and to remove the astringent harmful for the blue (Plate A, 3).

[1] Du Fay, *supra*.

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The whole cloth is then covered with wax, except for the places which must be blue, and immersed in a vat of indigo, and after that the wax is removed in a bath of hot water (Plate B, 6).

The lines that are to remain white are traced on the flowers with molten wax and (without, it seems, using any more astringent) everything that is to be red is painted with red mordant, and the places where other colours are to be painted with diluted mordants and mixtures of red mordant and Curcuma. A second dyeing follows, more concentrated than the first, which produces the final colours and once again the reddish colour of the ground left by the dye is removed with dung.

A yellow colour is next made from vegetable dye-stuffs. When painted on top of blue it produces green.

The whole thing is washed again and the process is terminated.

If we compare the process described above by Beaulieu with the account by the Jesuit Father Coeurdoux, significant differences become apparent : Beaulieu's workman treats the cloth with an aqueous solution of fat and astringent, mordants the lines of the drawing, makes a first maddering, then goes on with the indigo resist-dyeing, mordants after this the areas of the drawing, and makes a second maddering. Coeurdoux's workman, on the other hand, after the same first treatment of the cloth and mordanting of the lines of the drawing, goes on with the blue vat, renews after this the treatment with fat and astringent, mordants the areas of the design, and terminates with a single madder-bath. This method is rather puzzling : if the lines painted in black and red mordants have not been dyed with madder before the vigorous washing that precedes the indigo-dyeing (which would have the effect of removing the astringent), then the black should become considerably weaker and the red disappear altogether ; the original work would then have to be repeated, as the drawing would no longer be visible as far as the red parts are concerned. In this connection it is interesting to note that at a comparatively recent date an Indian specialist in painted cottons still used a method similar to the one described by Beaulieu and not the other ; he, too, used madder twice, once for the lines of the drawing and once for the surfaces, but *successively*, the blue coming last and in this way not being sandwiched between the two madder baths.[1] The moment selected for the blue vat must, generally speaking, be unimportant. All that we can say is that if the wax-resist should crack, thus allowing the indigo to run where it is not required, the damage resulting is perhaps less serious if the blue runs into the white rather than into the parts already coloured.

Could Father Coeurdoux, excellent observer though he was (at that time aged 51), have forgotten to describe one operation ? This may seem unlikely, but we cannot entirely discount the idea of an omission, because at the very beginning, when it is a question of preparing the cloth, he tells us to take buffalo milk to which an astringent has been added, without mentioning a preliminary soaking in a dilute acqueous astringent solution ; but later, referring to what

[1] W. S. Hadaway, *Cotton painting and printing in the Madras Presidency, Madras*, 1917.

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he said " at the beginning ", he speaks of the *two* baths described. A whole operation had thus been frankly omitted.[1]

Whatever the case may be, it seems obvious that depending on the skill of the workman and his customary methods, the good or bad quality of the water available, and of the ingredients used, and the kind of painting desired, the doses, the number of operations and their order of sequence would be bound to differ considerably from one painter to another in the same district, and also from region to region. We can therefore hardly go beyond the observation that at a certain date in a certain part of India a certain investigator saw a piece of cloth made in a certain way—after which all generalisations must be avoided.

Every attempt has been made to discover the quantities used by both Beaulieu and Coeurdoux, but this has failed owing to extreme inaccuracy of the weights and measures given. Is the " *ounce* ", for instance, the French *poids de marc*, and the " *pinte* " that of Paris ? What constitutes a "potful"? What does a bucket of water, or a bottle, correspond to in Pondicherry in 1742 ? Does the " ser " really measure 0.98952 litres—or more correctly 417.393 cm., the contents of a cylinder three French inches (of 2.7 cm.) in diameter and of the same depth? Did the Indian palam at that time weight (in *poids de marc*) 1 ounce plus $\frac{1}{2}$, or plus 1/7 or 1/8 ? Was the aune the Paris one of 1.188 m.? Does the cubit correspond to 48, 68 or 105 cm.?

All that can be said for certain can be summed up in the following two statements :

1. Beaulieu took a piece of cloth 6 aunes long ; after each operation he cut off $\frac{1}{2}$ an aune of the cloth ; for the 11th and last operation he was thus left with only 1 *aune* to dye. Four pounds (assuming the *poids de marc* at 489.5 grammes) of Indian madder seem to us excessive for that amount of cloth, seeing that at Basle in 1766 Jean Ryhiner reckoned $1\frac{1}{2}$ pounds of European madder for each length of 15/16 Paris *aunes*, and twice as much for the coloured grounds (which is not the case here). Unless the observer was mistaken, it would thus seem that the workman had been wasteful, for in all probability he was keeping to his customary formula.

2. Practically speaking, there is no agreement between the figures of Beaulieu and those of Coeurdoux, though this might be explained in part by the differences in size of the raw cloth that had been selected for painting,[2] and in the kind of the colouring wanted.

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[1] Beaulieu, who did not live in Pondicherry, had chosen the method consisting in having a painted cotton fabricated before his eyes. On the contrary the Father, who stayed in the town, merely questioned painters he had converted to Catholicism. This explains that errors could be made in the description of the succession of the operations.

[2] The above note gives the measurements of Beaulieu's cloth, i.e. 6 aunes. Father Coeurdoux (who does not mention having preserved samples) took a piece of " 9 coudées ", literally " 9 elbow lengths ", which he says was " the most usual size." Now there are *coudées*, $2\frac{1}{2}$ of which correspond to one Paris aune, which is about 48 cm. and others, used in India of about 68 and 105 cm. which would give lengths of 4.30, 6.30 and 9.40 m. Once again we see the difficulties involved when we try to fix measurements based on such vague terms as *coudée* or *aune*, which only make sense when dealing with the more distant past when the provenance

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To these observations a third of a different character must be added. Neither Beaulieu nor Coeurdoux make any allusion to the thickening of mordants and their application by block-printing, as customary in Europe. The hand of the workman alone did the work, either with pen, brush or pad. It is, however, known from an article published in the *Journal oeconomique* (Paris) in July, 1752, that when skilled craftsmen were scarce in India, a hollow mould was used filled with a kind of fatty ink to trace the contours of the design (the mordants, it appears, were always painted by hand).

Was it customary in India in bygone centuries to *print* mordants as well as to paint them on cloth—a process which would have necessitated, first the thickening, and then the subsequent elimination of the thickening matter used? So far no convincing evidence seems to have been published on this subject. On the other hand, the application of wax-resist material by means of blocks (a much more simple operation) seems likely to have been practised.[1,2]

Finally, to conclude this comparison on texts, it may be pointed out that whereas Father Coeurdoux explained at length how the blue vat was

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of the term is added. In the above connection, I have received the following note from Mr. John Irwin based on the evidence provided by contemporary English East India Company records : " There is ample evidence in the English records to show that on the Coromandel Coast, there were three standard kinds of calico especially in favour for chintz making. In order of importance they were *percallas*, *morees* and *salempores*. *Percallas* were usually very superior and reserved for the finest chintz, the dimensions being about 8 x 1 English yards. *Morees* were usually 9 x 1½ English yards, and *Salempores* 16 x 1 English yards." Further information on these types of calico will be found in *A Glossary of Textile Terms*, the Appendix to Mr. Irwin's essays in this book.

1 Cf. Bulletin of the Société Industrielle de Mulhouse, Mulhouse, France, no. 1, 1952, p. 14 ; no. 2, 1953, p. 70, (n. 2) and p. 76, (n. 16).

2 It is of interest to note certain differences between the *batik* and the chintz.

In the case of chintz, the cloth on which the mordants have been applied is *boiled* in the chayroot (*oldenlandia umbellate*) bath, where the reds, violets, browns, etc. appear simultaneously.

In *batik*, the cloth is first prepared with an infusion made of ashes and oil (generally castor-oil), then provided on both sides with the wax resists and the dyeing is done *cold* the cloth being rubbed during weeks with menakoudou (*morinda citrifolia*) mixed with djirak (*symplocos fasciculata*, which contains alum). The characteristic brown colour is obtained with soga (*peltophorum pterocarpum*), which contains iron according to another Latin name peltophorum ferrugineum Benth.) in a cold or tepid bath (observations divert). The dyers use many other ingredients, sometimes kept secret, so that it is difficult to determine wherefrom the mordant comes. The final treatment is a passage in lime water (not mentioned for the red, the calcium coming here most probably in sufficient quantity from the water used).

We know from French reports of 1746 and 1758 that oiling was also practised in India, but the descriptions refer only to *plain* dyeing of yarn or cloth, in a boiling bath.

In the present state of research it is therefore not possible to tell how the paintings mentioned in the Surate letter of 1634 (Archives of the East India Company) and based on a resist proceeding, were really fabricated. The blue, of course, is obtained in the same way, by resist, in both *batik* and chintz.

As soga does not seem to appear in India the dyeing with this vegetable must be something particular to Indonesia.

I have already made an allusion to this *batik* problem in f.n. 8, page 16 of my study *Les toiles peintes indiennes* (Bull. SIM IV/1962).

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mounted, Beaulieu is silent on this subject. The explanation is to be found in the aforementioned treatise by Quérelles (of 1760), in which the author writes : " I shall describe in a few words what I learnt (about blue dye) from the memorandum of M. de Beaulieu, who had it executed in his presence with the success expected. . . . This is the way the blue is prepared at Mazulipatan, a different method is used at Pondicherry which was also demonstrated to M. de Beaulieu and accurately described by him. . . . M. Lefevre, to whom I gave M. de Beaulieu's memorandum, has since tried it out . . . " A second work edited by Beaulieu (who, moreover, does not appear to have confined himself to investigations in Pondicherry) must therefore exist (or have existed), devoted entirely to indigo-dyeing. There is no knowing where it may now lie mouldering.

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APPENDIX I

ANALYST'S REPORT ON BEAULIEU CLOTH SAMPLES

The samples of cloth contained in the Beaulieu Ms. and reproduced here (Plates I-III) are entirely of cotton, Z-spun, with considerable variations in the diameter of thread. The weave is close, 70 threads per inch in one direction, 90 in the other. From the nature of the samples and the way they were cut, it was not clear which were warps and which wefts.

APPENDIX II

COMPARISON BETWEEN THE COEURDOUX AND BEAULIEU FIGURES

Equivalences admitted (without evidence as said before):

Pound : 1 livre poids de marc = 489.5 g.
1 once = 30.595 g 1 gros = $\frac{1}{8}$ once = 3.824 g

Ser & pot : 1 serre = 0.417398 litre 1 pot = 2 pintes (of Paris) = 1.85 litre

Palam : 1 palam = $1\frac{1}{8}$ once = 34.419 g

Aune : 1 aune (of Paris) = 1.188 m

Cubit : three possible lengths for the coudée

	Coeurdoux	Beaulieu
Cloth length	4.30 or 6.30 or 9.40 m	7.128 m
Preparation		
astringent (cadouca)	103.25 g	(1st) 125 g (2nd) 125 g
milk	1.85 l } only one recipe is given	.... 0.8348 l
water	....	3.70 l 1.25 l
Mordants		
black — iron	5-6 pieces of iron, a few pieces of iron dross each 9-10 times the size of an egg	489.5 g vitriolic stones
black — acetic acid	7.40—8.40 l	0.8348 l
	The French word "machefer" is ambiguous as dross is. Roxburgh (see *J.I.T.H.* IV/1959, p. 4, f.n.1) says that the cassim (iron mordant) is made with some broken pieces of the vitrified matter of a blacksmith's forge, and some bits of old, rusty iron.	
red — alum	61.2 g } for a "mean" red	30.6 g
red — water	1.85 l	0.4174 l
red — red wood	122.4 g	122.4 g
violet	$\frac{1}{3}$ black, $\frac{1}{3}$ red, $\frac{1}{3}$ rice water (many other combinations and variations of concentration for other colours)	0.4174 l black mordant diluted in 4.174 l water
yellowish red	....	alum 34.4 g, curcuma 30.595 g, rice water 4.174 l
Maddering		
chayroot	1.47 k° } only one operation is mentioned	(1st) 735 g (2nd) 1.96 k°
water	11 (?) l	5.5 l 7.4 l
Yellow (painted)		
cadouca	ca. 34.419 g	30.595 g
,, "flower"	do	244.76 g
chayroot	handful	61.2 g
alum	15.3 g per bottle	....
water	3 bottles	3.34 l

It appears from the above comparison that the receipes of Coeurdoux are less accurate than Beaulieu's, especially regarding the preparation and the maddering. In both cases one operation seems to have been omitted.

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Coeurdoux's violet is a wine-lees red with a violet touch, and thus obtained by the process of mixing red and black mordants. The more genuine violet is produced by diluting the black mordant with water (Beaulieu).

The first maddering of the naval officer, which gives the outlines of the design, and the single maddering of the Rev. Father have exactly the same proportion of chayroot and water, whilst the second maddering of the former, which dyes the surfaces, is much more concentrated. This reinforces the idea that Coeurdoux failed to describe one red bath.

From the discrepancies we noted, one can but conclude that if the theory of painting cottons in India is well known for the XVIIIth century, the practice remains rather obscure.

Neither Coeurdoux nor Beaulieu made an allusion to the possibility of adding chalk to the madder bath (as this was done in Europe later on) and this explains why this product is not represented in the above mentioned enumeration. Yet, calcium is indispensable for the formation of the genuine red lac, which is a calcium-aluminium-alizarate, the calcium coming either from the water or the madder or both, or being added by man to the bath. The Indians do not seem to have been aware that what they looked for in certain waters or madder qualities to improve their chintz was the presence of calcium. Thus we understand why the production of painted cottons of high standards remained bound to certain places or regions in India. In Europe the case was quite different, the absence of this element could be palliated by man from the time (second half of the 18th century?) when manufacturers who were not located on a calcarous soil, had discovered its necessary presence.

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CHAPTER II

New Light on Old Material

THE Beaulieu Ms. of 1734, which was presented and discussed in the previous issue of this Journal, owed its special importance not only to the fact that it was the earliest known account of traditional Indian methods of cotton-painting, but also because there are preserved with it eleven original sample fabrics illustrating stages of the process. The special value of the Coeurdoux letters of the following decade derives chiefly from their fuller description of detail.

Father Gaston Laurent Coeurdoux was born in Bourges on 18th October, 1691. He joined the Company of Jesus as a novice in 1715 ; left for Madura (India) in 1732, and served as missionary at Pondicherry. In 1740 he became Superior at Karikal ; in 1745, Procurator at Pondicherry ; in 1747, Superior-General at Pondicherry. In 1751 he was replaced by Father Lavaud and became again simple missionary at Pondicherry, where he died in 1779, " versed in Tamil and Telugu."

The first of his two letters on Indian cotton-painting was dated 18th January, 1742, " aux Indes Orientales " and addressed to Father du Halde of the same mission, resident in Paris. It was first published in the 26th collection of " Lettres édifiantes et curieuses écrites des missions étrangères par quelques missionaires de la Compagnie de Jésus, Paris, MDCCXLII." Father du Halde, in offering this new collection, states that " this book is suitable to amuse and edify in piety [*sic*]." Permission for publication given by the Father Superior dates from 7th April, 1743, approval of the Sorbonne from 24th April following. Cotton-printing was strictly prohibited in France at that time (the ban was not lifted until 1759), which makes it the more surprising that illegal methods of manufacture should have concurrently been made public. Father Coeurdoux drew his knowledge from " various neophytes skilful in this sort of work on whom I recently conferred baptism."

It was explained in the previous article that as early as 1766 an eminent Basle cotton-printer had studied the letter and commented on it in a Ms. which was not actually published until nearly a century later (1865). No trace of a similar analysis by any other European manufacturer of the eighteenth century is known[1],

[1] In 1768 a book was published in Paris under the title *Mémoires géographiques, physiques et historiques . . . tirés des lettres édifiantes et des voyages des missionnaires jésuites par l' Auteur des mélanges intéressants et curieux.* (The author was Jacques Philibert Rousselot de Surgy.) The work is a sort of " digest " of the letters written by the Jesuit fathers, and the first volume reproduces very largely the well-known Coeurdoux-Poivre-Paradis reports. They are followed by " Observations " made by Mr. Bourdier, physician, who lived in Pondicherry and on the Coromandel Coast from 1754 to 1765. This doctor, says the author, examined particularly the various proceedings concerning the preparation and the dyeing of cottons in the East Indies as related by the Jesuit missionaries, and was kind enough to communicate his remarks. Truly

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and there is no indication what influence this work may have had on European cotton-printing as practised in 1743. But the report by the Jesuit Father was scrutinized very carefully by the celebrated English chemist Edward Bancroft (1744-1821) in his book entitled *Experimental researches concerning the philosophy of permanent colours*, London, 1794 (2nd edn., 1813).

It was in England again (though very much later) that a nearly complete translation of this letter was to be made by G. P. Baker in his magnificent and monumental work, *Calico painting and printing in the East Indies in the 17th and 18th centuries*, London, 1921. The translation is accompanied by many remarks, one of which tells us that the letter was not published until 30 years after it had been written. This error was probably due to the fact that, to judge from his reference, the translator did not have before him the edition of 1743, but volume XIV of a new edition published in 1781.

In Holland the letter was partly reproduced in French, with important notes, in the fundamental work by Rouffaer and Juynboll, *Die Indische Batikkunst* (German and Dutch texts, Haarlem, no date, prefaced in 1899). A complete reproduction of the original text was scheduled to appear in a supplement which was never published.

The oldest German translation of the celebrated Letter may well be one that I discovered by chance in the " Magazin für Farber,", Zeugdrucker and Bleicher, edited by D. Friedrich Hermbstädt, vol. 2, 2nd edn., Berlin, 1811, under the following title : *Beschreibung der Art and Weise wie die indianischen Kattune oder Zize, in Indien gemahlt werden. Nach Savary's Angabe (mit Bemerkungen vom Herausgeber)*.[1] Strange to say, the name of Coeurdoux does not appear at

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spoken, they are rather deceiving. Here are three comments worth picking out : (1) Father Coeurdoux omitted to say that when the Indians decided to paint cottons they took the cloth from the weaver after a first bleaching and wore it against their naked skin ; everybody was compelled to do so, and thus a whole family was clad in cottons destined to be painted. After 8 to 10 days the cloth was washed and treated with myrobolan and milk in the well-known way. (2) The cadoucaipou (an excrescence caused by the sting of an insect) is called by the Europeans " fleur de mirobolan ", myrobolan flower, and this explains the errors made by some historians of cotton painting on the subject (see p. 20 of this article). (3) The chayroot produces a good red only in so far as it is growing on certain sandy grounds containing many broken or rotten shells. The doctor adds that he had already remarked in France that the *gallium album vulgare*, which has also a red-dye-producing root, gave always better results when picked on old walls or rubbish. The necessity of calcium for the formation of the red lac on the fibre was of course not evident in India at that time (see fn. 1, p. 18), but the virtue of some soils or waters had certainly been discovered a long time ago.

A medical thesis by Claude Bourdier de la Moulière, dated November, 1743, is preserved at the Bibliothèque Nationale, Paris. It is not impossible that this Bourdier and the above-mentioned are identical.

1 The Hermbstädt translation appeared already in the first edition of volume 2 of his Magazin, the date of which I do not know. It was reproduced slightly shortened, in the following work, chapter 99, published in Erfurt in 1809 : Georg Wilhelm Holterhoff's *Kunst und Schonfarbers vollstandiges praktisches Handbuch der Kunstfärberei, Zweiter Band Enthaltend die Färbung der Seide un seidenen Zeuge*. The publisher says that although this volume deals only with silk, the reader will be glad to know how painted cottons were made in India; he thinks it possible

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all, although it gives the full text of his letter. As for Savary, this evidently refers to one of the editions later than 1743 of the dictionary of commerce of that name which was translated into German (1755?), and probably English too. The most complete edition—the Copenhagen one of 1759-65—refers in the article under "*Toiles*" to the *mémoire du P. Coeurdoux, in the* 20e (?) *Recueil des lettres édifiantes*. This fact does not explain Hermbstädt's omission of Coeurdoux's name. Savary was perhaps more explicit elsewhere. As a matter of fact research in dictionaries is often an arduous task—for example, there is no mention of cotton in the *Dictionnaire portatif des arts et métiers*, published in Paris, 1766, although the picking, ginning, carding, spinning and weaving of cotton is accurately described in the article on muslin.

Father Coeurdoux was the author of a second letter to which allusion is sometimes made in specialised works (e.g. the ones quoted above by G. P. Baker and Rouffaer and Juynboll). We must discuss it here because it gives a useful description of a name—that of "Fleurs de Cadou"—employed in the first letter. This substance is used for yellow colour, and in 1766 Jean Ryhiner noted that "we have no exact knowledge of cadou, in particular of the flowering kind." Now in his second letter, the one written on 22nd December, 1747, from Pondicherry, and published in the 27th collection of *Lettres édifiantes et curieuses* of 1749, Father Coeurdoux writes (p. 434): "I must not omit here a further product of the Cadou tree which is called Cadoucaipou, that is to say the flower of Cadoucaie—although it is anything but its flower. It is a kind of dried fruit . . . this type of nut is found on the leaves of the Cadou itself and is produced in the same way as Gall nuts and some other similar excrescences" (seven pages follow on painting and dyeing yellow in Pondicherry using Cadoucaipou).[1] This passage, which seems so far to have escaped the various commentators, for they speak of flowers of cadou as if it were a question of real flowers, is transcribed here because of the supplementary information it gives.

In his letter of 22nd December, 1747, Father Coeurdoux says further: "I do not know whether the letter I wrote in 1742 on painted cottons in India can

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that the improvement of the described proceedings will be left to the German cleverness. It is pleasant to notice that Coeurdoux's letter (his name is not mentioned) was published already in 1743, had been reproduced at least three times in French publications of the 18th century, and largely commented in English by Bancroft in 1794. This ignorance is rather curious, coming from specialists in dyeing.

[1] Both de BEAULIEU and COEURDOUX mention only a vegetable yellow, but it appears that another yellow was also used in India. I discovered this fact whilst studying in 1965 the painted and printed cottons made by Louis-Henri, duc de Bourbon (1692-1740) in his Chantilly castle. He was Prime-Minister of king Louis XV of France from 1723 to 1726, and during these years ordered and got reports (now probably lost) concerning the fabrication of painted cottons in India. Exiled for political reasons on his estates, he created in his Chantilly castle, near Paris, a well-known China manufacture working for the public, and also, but only for his own pleasure and that of his friends, a workshop where cottons were painted and printed (this industry being at that time still severely prohibited in France). The library of the Muséum d'Histoire Naturelle in Paris owns an undated and anonymous Ms. describing the manner employed in Chantilly by the duke for painting cottons. For the yellow the following informations are given: the yellow in India is made with the iron mordant, but a better one is obtained

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prove of any assistance in perfecting the art of dyeing in Europe : that at least was the aim I had in mind. Since then I have tried here to arouse the fancy of some persons able to improve on what I said on these matters and to add some new and useful knowledge. Among others I applied to M. Le Poivre[1] late of the Foreign Missions, whom the misfortunes of war had brought to Pondicherry in 1746. A bullet had carried off his right arm ; but in his left one he found the whole of that ability for painting which he was apparently to lose in consequence of such sad accident. As soon as he was in this city, he became acquainted with what I had written on cotton painting, and, having undertaken to put it into practice, he succeeded in doing so. [This passage shows that Father Coeurdoux's first letter also came from Pondicherry.—P.R.S.] I then urged him to set down in writing his considerations and remarks, whether they were consistent with mine or opposed to them . . . my entreaties have at least produced the letter I am forwarding you." This very interesting document is also published in the above-quoted 27th Collection with an important commentary added by Father Coeurdoux which begins as follows : " This letter gave me the opportunity of making some experiments and gave me some new ideas which may be of interest. Here they are . . . [lack of space unfortunately prevents us from studying them here]." He finishes with these lines : " M. Le Poivre painted a chay-plant from nature, which I have the honour of sending you, it seems to me that this, too, in addition to his letter may prove of interest to the curious." The 27th Collection contains a very beautiful engraving of this Indian madder-plant which is certainly a reproduction of Le Poivre's painting. There is every reason to suppose that it has remained almost unknown.

Neither of the two authors mentioned makes any allusion to Beaulieu's stay at Pondicherry or to his successful investigations made before 1739. Father Coeurdoux, however, in this letter of 1742 feels constrained to say : " I do not know whether I shall prove more fortunate than others before me in this direction. As, however, they would not be conversant with the native tongue, indispensable for dealing with the painters, nor accustomed to their ways, and since their very condition must give rise to a certain mistrust in these timid natives, I doubt whether they could have successfully carried out the orders imparted in this matter." This text shows that there must have been considerable

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from Avignon berries. If you want a green like the Indian one, that is a brownish green, put on the blue, with a brush, the iron liquor used for the black. The Ms. calls this green " vilain " (ugly). A chemical analysis of the greens and yellows of old Indian cottons could most probably show the presence of iron in these colours if this mordant which has a yellowish tint, has been employed.

[1] Pierre Poivre (1719—1786), missionary and traveller, studied during 4 years botany, natural history, proceedings of arts and manufacture, drawing, painting, etc. . . . At the age of 20 he left for China and Cochin-china. When returning to France his ship was attacked by the English in the Banca Straits (5.2.1745), he lost an arm, was taken prisoner and sent back to Pondicherry, where he stayed for a certain time. (Extensive biography by de Gerando in *Biographie ancienne et moderne*, Vol. 35, Paris 1823).

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interest in France in Indian methods of cotton-painting.[1] Who were the investigators to whom the good father was referring with some severity? Why did "their very condition give rise to a certain mistrust" among the "natives"? Could it perhaps be a reference to Beaulieu? Unless unexpected information is forthcoming, such questions must remain unanswered.

As for Le Poivre, even less well-informed, he expresses himself as follows in his letter of 1747 to Father Coeurdoux: "These are, Reverend Father, all the observations I could submit on the way the Indians paint their cloths in Pondicherry; if you consider them appropriate, they may help the purpose you have in bringing to Europe the secret of the Indies. It is surprising that, so far, there should not have been in this country any European interested in the matter, endeavouring to enrich his own country with an art from which so much advantage could be drawn."

As a matter of fact, from the end of the seventeenth century onwards, work had been proceeding in Europe in the "Indian manner"[2], though it is true no

[1] Especial interest was also shown in the manner of dyeing cotton cloths red. In a letter of 13th October, 1748, from Pondicherry Father Coeurdoux transcribes with commentaries a memoir of "the late Monsieur Paradis on various methods of dyeing cloths red." The latter notes different methods, the first consisting of an oil process and corresponding to the process known in Europe as Turkey red; the second is the same as that used for producing a fast red on painted cottons (astringent, alum, madder); the third is very imperfect, the madder being replaced by Sapan wood. This memoir is interesting, because in it the author describes the process of Turkey red applied to cotton *cloth*, whereas in other descriptions it is used only with reference to the dyeing of cotton *yarn* in India.

There we also find detailed studies on the hard water used by Indian dyers and painters, which seems to have been almost completely unknown to historians hitherto describing the manufacture of painted cottons. The authors are "Monsieur Cayerefourg, surgeon-major at Pondicherry" and "frère de Choisel", one of Father Coeurdoux's collaborators. In a letter of 22nd December, 1747, the Reverend Father expresses his intention of making known "later on" the memorandum of M. Paradis. We saw above that in the following October he was already the "late M. Paradis". We may well believe that the work of this observer dates from about the same time that "Turkey red" was said to have been introduced into France (1746-47), chiefly by Greek dyers established at Marseilles who worked on cotton yarn. The fact that it was first published in the 28th collection of *Lettres édifiantes* . . . (printed only in 1758) must have robbed it of all interest for the specialists who would have known about it at that time. M. Paradis can probably be identified with the Paradis who was killed during the siege of Pondichery on 13-9-1748 and whose career is described by A. Martineau, *Dupleix et l' Inde Française*, Vol. 2, Paris, 1923.

As early as 1733 Du Fay had been asked to arrange the presentation of the memoirs of M. De la Croix, Commissioner-General of the Navy, to the Académie des Sciences. The subject-matter was apparently of interest to that institution (Arch. Nat. Marine, B2 292 (192), information supplied by M. Paul Leuillot, already cited). In view of the learned academician's speciality it may well have been a work on dyeing.

[2] Jean Ryhiner, whose father, after an apprenticeship in Holland, had founded (c. 1716-17) at Basle the first printing factory in that town based on Indian processes, long before the reports of Coeurdoux, Le Poivre and Beaulieu, could only remark, after his analysis of the above documents, in 1766: "Our theory and principles are almost the same as those of the Indians, but the latter have the advantage of possessing certain herbs which are more suitable for this method of manufacture; it would also seem that manpower is more readily available in that country because the use of painting instead of printing demands a greater degree of skill and is much slower, which means that even granted all things equal we could never adopt their methods, for we lack skilled craftsmen and could not keep the maintenance costs so low."

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account of the processes employed at that time, or from the time of their introduction, has come down to us. The (excusable) ignorance of the two authors in this respect was the fortunate cause of the two letters of 1742 and 1747 which form the most complete document we possess published on traditional Indian methods of cotton-painting. The fact that it lacks samples makes the subject of the present study—the Muséum Ms.—all the more precious. Although more concise, it is true, it is furnished with eleven such samples.

The *Journal œconomique*, already mentioned, published in its June, July, August and September numbers in 1756 a series of articles on dyeing in India, followed by a memorandum on the method of painting cottons in India. The editors of the *Journal* do not mention the name of the author, but they do tell us the manner in which they received the paper : " A wise citizen of the town of Amiens brought to light the memoirs of one of his friends containing everything he had seen and even had had demonstrated to him." Everything that deals with the actual dyeing of cotton yarn, in red, blue, yellow, green and black seems to be the result of personal observation on the spot, the process known in Europe under the general name of Turkey red in particular being very accurately described. There are also indications of price and quality.[1] The description of the manufacture of painted cottons on the other hand raises a very curious problem as to the origin of the text. The author states that he had a painter come to his house, but as the time was already the end of October the work was often interrupted by the rains. Frequent absences on the part of the workman also caused much loss of time as a result of which " I could not have all the colours I wanted done." If we compare the texts of the *Journal œconomique* with the Muséum manuscript we cannot fail to be struck by an astonishing similarity, suggesting either a copy or a common origin—unless we accept the fact that the same operation can produce quite naturally in two different narrators an identical style.

Here is a particularly instructive example to be noted in this connection :

Anonymous text	*Beaulieu-Du Fay text*
Il plia la toile en plis de 4 pouces ou environ et après l'avoir un peu pressée il la trempa plusieurs fois de suite dans une jarre pleine de liqueur propre à teindre en bleu ; puis ayant étendu la toile il appliqua de cette couleur sur les endroits qu'il jugea n'en avoir point assez. Ensuite il étendit la toile à l'ombre pour la faire sécher.	Il a plié la toile en plis de 4 pouces ou environ et après l'avoir un peu pressée il l'a trempée plusieurs fois de suite dans une jarre de liqueur propre à teindre en bleu et ayant étendu la toile il a appliqué de cette liqueur sur les endroits qu'il a jugé n' en avoir pas assez pris, ensuite il a étendu la toile à l' ombre pour la faire sécher.

But there is more to come: we saw that the 7th operation is described wrongly and incomprehensibly in the Beaulieu Ms. in the Museum. The same error recurs

[1] " The tagrevéré seed, employed for the indigo vat, worth now 4 to 5 pagodes the bar, went in 1725 as high as 1 pagode the (French) pound",—that is more than 100 times more. This shows that the document could not have been written before this year. It is also said that the chayroot coming from the Northern part of the Coromandel Coast is much superior to that of the Southern. In Negapatam the price is 5 pagodes the bar of 480 (French) pounds, towards Paliacate it goes up to 10 to 40, that is 2 to 8 times more.

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in the anonymous memorandum in the *Journal œconomique* of August, 1756: " To colour the flowers he drew little lines, those to be blue [?] were marked with molten wax, and those to be red [?] or green first with Chouris and then with liquid blue dye. All these lines will be found in the 7th piece." We have an impression that here, as in the Beaulieu ms., a sentence has been skipped. Moreover, the colours are wrongly given.

Like Quérelles' text, the anonymous text is sometimes augmented by passages which are not found in the Beaulieu Ms. At the same time we do not always find the same technical terms in the three documents that we shall call here M(uséum), A(nonymous), Q(uérelles). Thus mirabolan only occurs in M; A and Q speak of cadouca (both words are found in Coeurdoux). A and Q mention a log of wood, whereas M says more precisely trunk of a Kakimaka tree (Coeurdoux says Indian acacia or a tree known as Porchi). We find in M vitriolic stones, and burnt stones in A and Q, the latter saying more precisely that they were vitriolic (Coeurdoux speaks of iron and iron dross). A is the only one to mention safran, which is *terra merita* (alias Curcuma or Turmeric) to M and Q (Coeurdoux does not mention these two plants in his first letter). Q speaks only of lemon whereas M and A add the fruit of Jambelon (not mentioned by Coeurdoux).

M, A and Q all use the *ser* measurement. The last named states more precisely, in italics, that " this is a measure with a capacity of 9 ounces of Gengely oil, which, without appreciable error, is the same weight as linseed oil." Now A tells us in his work on dyeing yarn in India, which in the *Journal œconomique* precedes the one on painted cottons, that " the *ser* used to regulate the quantities of the liquids used is both a measure and a weight of about 9 oz." Coeurdoux does not mention this volume in his letter of 18th January, 1742, on painted cottons, but defines it, and in a more lucid way than the two preceding authors, when he copies the Paradis memoir (see footnote no. 1, p. 18) in his letter of 13th October, 1748: " the *ser* is a cubic measure with a diameter of 3 inches and of equal depth. The *ser* is also an Indian weight equivalent to 9 ozs." By taking French inches at 2.7 cm., we would get a cylinder at 8.1 cm. wide and 8.1 cm. high with a cubic content of 417.39 cm. A history of India published in Paris in 1814 gives the *ser* as 0.98952 litres—that is, more than double the amount.

In the cases M, A and Q the workman took 6 aunes of cloth. A " divides into 11 pieces the length I had had dyed," and M and Q both state that 11 pieces were successively cut from the whole (Coeurdoux did not take any patterns). But whereas A deems it necessary to say that he was " unable to have work done in all the colours he would have liked," Q tells us that the process described is the longest because all the colours are used, and he seems to be right in this. Finally, the last difference, whereas M is silent on the question of lustre, this last operation is described by both A and Q in entirely different terms.

Did the anonymous author of the *Journal œconomique* of 1756 (who seems actually to have been in India and to have understood dyeing[1]) simplify his work

1 Cf. Bulletin of the Société Industrielle de Mulhouse, Mulhouse, France, no. 2, 1953 pp. 64, 72 (n.4).

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by frankly plagiarising Beaulieu-Du Fay ? The similarities in the text are indeed puzzling. But so far we know nothing of this person, neither the date of his stay on the Coromandel Coast, the products he describes, nor of his possible relations—not to say identity—with Beaulieu.[1] One name might give us a hint : the anonymous author mentions incidentally, when speaking of indigo : " M. Guillard, chief agent of the Company at Ayanaon,[2] some 40 leagues from Mazulipatam, where they make some very fine ones, sent me details of the production. On the Coromandel Coast, good quality indigo is used only for paintings and for some fine dyeing."[3]

The anonymous author was therefore in contact with the Compagnie des Indes, the same Company for whom Beaulieu worked as naval officer. According to A. Martineau, *Dupleix et l'Inde francaise*, vol 2, Paris, 1923, Guillard, already in Yanaon in 1727, went to the Masulipatam *comptoir* in 1738, and was in

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[1] The *Journal œconomique* of September, 1756, ends the series of articles on the manufacture of painted cottons in India with the following observations : " This was the Memoire we received on dyeing in India. We do not doubt that many of our readers have wearied of the countless details, almost always the same, and that it would seem possible to reduce them to a kind of system subject to general and particular rules. The reader, it is true, would have been more entertained [*sic*] but it would have been less instructive, and the author of the memorandum who is thinking only of our manufacture of dyed and painted cottons [these lines were written three years *before* the lifting of the ban in France—P.R.S.] made a careful choice of the method likely to be most helpful to the manufacturers of this kind of work. Morever, it was much safer for him to describe simply the multiple operations than to risk giving false information and to be himself deceived if he attempted to establish a reasonable theory of what he had seen from people who never reason and merely work to a fixed routine. We can draw this conclusion from the information he gives in two passages in his memorandum, where he speaks of the character of the Indians . . . although the author of the memorandum speaks only of countries he has seen, that is the Coromandel Coast . . . " The editors did not deem it necessary to publish the name of the " wise citizen of the town of Amoiens " who had procured the memorandum for them, although they must certainly have known it. Perhaps this person himself withheld the name of the " friend " whose work he had exhumed. What could have been the motive for so much discretion regarding a purely technical matter ? We do not know. Perhaps, too, one must not take the *Journal œconomique* too literally. Whatever the case may be, it doesn't appear possible to draw any accurate conclusion from the above lines as to the identification of the author with Beaulieu. We may add further that the anonymous author states that his painter began operations when " we were already near the end of October." But to judge from successive calls at Pondicherry of the vessels on which Beaulieu was serving (in so far as they are entered in the archives of the port of Lorient) this naval officer was not at Pondicherry at that time of the year, and the only long stay that he made seems to be the one lasting from 29th July to 27th September, 1734. If this is really so then the anonymous author cannot have been Beaulieu himself.

[2] Yanaon or Yanam, in the district of the same name, is 563 km north of Pondicherry, at the mouth of the Godavari, on the coast of modern Andhra State, and 27 km from Coconada, a place well-known for its cottons. This former French territory was returned to the Indian Union in 1954.

[3] We saw above that, according to Quérelles, Beaulieu too—in a memorandum that has unfortunately remained unknown—described among other things the method of preparing blue at Masulipatam. The text referring to that place, which is copied by Quérelles, is very similar to that of the anonymous author, nothing more ; the quantities given on the other hand are exactly identical.

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Pondicherry by 1742. He fought with Paradis at the siege of Pondicherry in 1748, and rose to be general treasurer of the company between 1754 and 1758.

For the moment, therefore, it is impossible to know whether Beaulieu's report—and his observations were made prior to 1735—is an original report or whether the necessary information was supplied by a third party, who could well be the anonymous author of whom we have just spoken. But we might also wonder whether the latter did not quite simply plagiarise Beaulieu, or again whether these two persons did not have a common informant[1]—or even if Beaulieu is identical with the anonymous author !

The above remarks testify to the difficulties which beset the student when seeking to establish the priority of an old text dealing with a technical process. A last example will show also how difficult it is to see clearly when two statements are opposed. Speaking of yellow at Pondicherry the anonymous author of the *Journal œconomique* of 1756 tells us that they used " the flowers of aldecay or cadoucay . . . They are thick, bent by the wind [?] they are dried and kept for the purpose. The tree on which they grow is tall, the same shape as the olive tree, and grows on the Coromandel Coast. One can also use the fruit of the latter tree for the same dye, it has the same consistency and the same colour as nutmeg." Father Coeurdoux, however, in whom we have confidence, describes in seven pages the process for yellow, also at Pondicherry, taking care to tell us that the flower in question is not a flower at all but an excrescence (a kind of flat nut—to use one of his terms). With regard to the cadou fruit, he says that " it grows on a tree of medium height . . . everywhere, but principally in the Malleiâlam, a

[1] Bancroft (op. cit., German translation of 1818, 2nd volume, commented by J. G. Dingler and W. H. von Kurrer) mentions (p.492), besides the *Letteres édifiantes*, vols. 26 and 27, " several handwritten reports by M. Dufay and M. de Rabée (the latter having at that time just come back to France from India)." de Rabée is perhaps the same as " un nommé de Rabec" , mentioned by Martineau (*op. cit.*). According to Mlle Beauchesne, Archiviste de la marine à Lorient, Rabec left Chandernagor for France on the " La Reine ", 23/1/1755, travelling at his own expense with two servants, black and white. Further details are revealed about de Rabec in the *Mémoires des scavants étrangers* (i.e. those outside the Académie), vol. IV, 1763, Correspondance déel' Académie, Memoires de mathématiques et de physique : M. de Rabec, a St. Malo merchant coming from India handed over his ' Journal ' to the abbé Mazéas, to be deposited at the Académie, which was conformable to the mémoires of Dufay. Rabec's Ms. may still exist and be discovered one day. Guillaume Mazéas generally called abbot Mazéas (1712-1776), member of the Royal Society in London, is the author of a well-known study of the proceeding employed in India for dyeing red, published in the " Corps d' Observations de la Société d' Agriculture, de Commerce et des Arts, établie par les Etats de Bretagne, tome des années 1759-60". He says that, after many trials, he became aware of the necessity of the presence of chalk in the madder bath, to obtain a fast red with the alum mordant, and thinks that the special waters looked for by the Indians must have contained this ingredient. It is well possible that he is thus the first observer to have mentioned, in a, published memoir, the calcium problem, most important for the printing industry. In any case, this discovery can no more be attributed alone to the famous Alsatian manufacturer HAUSSMANN of Logelach near Colmar (France) who came in 1776 to the same conclusions (for HAUSSMANN and the doubts I expressed see Bull. Soc. Ind. de Mulh. IV /1962, Les toiles peintes des Indes, p. 15 f.n. 5).

Mazéas was not a printer himself and his study contains many errors. No allusion is made to the oiling process utilised for the production of the red called in France " Indian " or " Turkish ".

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mountainous country (according to its name), extending considerably along the Malabar[1] [*sic*] Coast. The dry fruit is about the size of a nutmeg."

So many observers, so many different accounts—an old story.

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[1] It is possible that the Father wanted really to speak of the Malabar Coast, as elsewhere he quotes an informator who witnessed the *cadou* crop in the mountainous regions situated in the West of Pondicherry, near the Malabar Coast.

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APPENDIX "A"

THE LETTERS OF FATHER COEURDOUX, 1742 and 1747

[This is the first complete and exact English translation of the first Coeurdoux letter, written in 1742. The second letter, of 1747, has as far as we know never previously been reprinted in full nor translated into any other language.

EDITORS]

A LETTER FROM FATHER COEURDOUX, A MISSIONARY OF THE COMPANY OF JESUS, TO FATHER DU HALDE OF THE SAME COMPANY

The East Indies, January 18th, 1742.

My Reverend Father,

The peace of our Lord

I have not forgotten that in several of your letters you have urged me to acquaint you with the discoveries I might make in this part of India, since you are persuaded that knowledge is to be acquired here which, if transmitted to Europe, would possibly contribute to the progress of science or to the perfection of art. I should have followed your advice sooner, had not almost continuous occupation taken up all my time. Recently, with a little leisure, I have used it to find out the way in which Indians make those beautiful cloths, which form part of the trade of those Companies established to extend commerce, and which, crossing the widest seas, come from the ends of Europe into these distant climes to search for such things.

These cloths acquire their value and price from their brightness and, if I may say so, from the solidity and fastness of the colours they are dyed with, and which, so far from losing their brilliance by washing, actually grow more beautiful. The reason why European industry has not yet reached this point, as far as I know, is not for want of research on the part of our own skilled men of science, nor for want of ability in our workmen; but it would seem that the Author of Nature, as a set-off against other advantages which Europe enjoys, has granted India ingredients, and, above all, certain waters, whose particular qualities have much to do with the beautiful combination of painting and dyeing represented by Indian cloths.

What I have to tell you, my reverend Father, on these Indian paintings has been learnt from various neophytes skilful in this sort of work, on whom I recently conferred baptism. I have questioned them frequently and separately, and it is their replies that I am now sending you.[1]

I

Before attempting to paint the cloth, it has to be prepared in the following manner :

1. Take a piece of new, fine and closely woven cloth, the most common length being 9 cubits.[2] Half bleach it (I will say later how this has to be done). Take about 25 of the dried fruits of the *Cadou* or *Cadoucaie*[3] or, to be more exact, the weight of 3 *palams*. This Indian weight is equivalent to $1\frac{1}{8}$ oz., since $14\frac{1}{4}$ palams make 1 lb.

1 Whilst Beaulieu asked a painter to operate before his eyes and took samples. Coeurdoux merely questioned a certain number of craftsmen. This explains the contradictions found in his report and which will be the object of the later footnotes 2 and 3, p. 109.

2 For the length of the cubit see references to "coudées", p. 84 footnote 2.

3 Aldecay in telinga, cadacay or caducay in tamul (Bancroft). The ounce is the French one, weighing 30,595 g.

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2. Break up the fruit to remove the kernel, which is of no use. Reduce the fruit to a powder (Indians do this on a stone, and make use of a stone cylinder similar to those used by pastrycooks in rolling out their dough).

3. Pass the powder through a sieve and put it into about 2 pints of buffalo milk, increasing the milk and the weight of *Cadou* as needed and according to the quantity of cloth.

4. After a short while immerse the cloth as often as necessary to be well steeped in the milk ; then take it out, wring it strongly and put it to dry in the sun.

5. The next day wash the cloth lightly in plain water, wring it and, after having dried it in the sun, leave it in the shade for at least one quarter of an hour.

This *internal* preparation of the cloth[1] (as it may be called) is succeeded immediately by an *external* preparation having for its object only the surface of the cloth. To make it smoother, and in order that it offers no obstruction to the brush, the cloth is folded into quarters (or sixths) and is beaten by one piece of wood upon another smooth one, care being taken that it is beaten evenly all over its surface ; and when sufficiently beaten, the folds are reversed and the operation repeated.

At this point Reverend Father, I should like to add some remarks, which you will not, I think, consider quite useless :

1. The *Cadou* fruit is to be found in woods, on a tree of medium height ; it grows almost everywhere, but principally in the *Malleiâlam*, a mountainous country (according to its name), extending considerably along the Malabar Coast.

2. This dry fruit, which is of the size of the nutmeg, is used here by the physicians, entering especially into the preparation of medicines given to women recently delivered.

3. It is extremely strong to the taste ; however, some people say that, after you have kept a bit of it in your mouth for some time, it faintly tastes of liquorice.

4. When, having slightly moisted and broken a piece of it in your mouth, you take it between your fingers, you will find it very sticky.

It is in a good measure due to these two properties, i.e., its astringency and its unctuousness, that the adherence of colours on Indian cloths must be attributed, but above all to its harshness. This is, at least, the opinion of the Indian painters.

For a long time people in Europe have been endeavouring to discover the art of fixing colours and of giving them that adherence which is to be admired on Indian cloths. I shall perhaps disclose this secret, at least for several colours, by the information I am now giving on the *Cadoucaie*, and above all on its main quality, which is its extreme harshness. Could not some similar fruits be found in Europe ? Would not the gall-nut or the medlar (dried before maturing), or the pomegranate rind show properties not unlike those of the *Cadou* ?[2]

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[1] This preparation with fat and a vegetable astringent (cadou) has the object of preventing the mordants from running on the cloth when painted and assisting the development of the colours they engender during the maddering operation.

[2] The cadou or myrobolan contains tannin, like the gall-nut. It acts as a dyestuff, or a mordant, or both together. With iron it gives black and thus appear the outlines of the drawings under the pencil of the painter operating on a cloth treated with cadou. In the subsequent chay bath the black turns deeper. When dyeing red with alum the tannin contributes to the fixation of a maximum of aluminium on the cotton fibre, giving more " nourished " shades. The proper colour (yellow) of the astringent has most probably also an effect. The so called " galling " became useless and disappeared little by little in the European printing industry after the discovery (second quarter of the 18th century?) of the aluminium acetate, which abandons more easily than alum its metal or aluminium to the cotton fibre.—Curious to say, this astringent treatment seems to have never been the object of a real scientific theory by the specialists of the dyeing problems.

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To what I have just said I will add the result of certain experiments I made with the *Cadou* :

1. Lime added to an infusion of *Cadou* produces a green colour. When there is too much lime, the colour turns brown. When too much of this infusion is poured on this brown colour, it appears whitish at first, and soon afterwards the lime is precipitated in the bottom of the vessel.

2. White cloth steeped in a strong infusion of *Cadou* becomes a very pale yellow ; but when buffalo milk is mixed with it, the cloth comes out a rather pale orange colour.

3. Having mixed a little of our European ink with some *Cadou* infusion, I noticed at several places within the liquid a bluish film of the kind seen on chalybeate water, with the difference that this film was in the liquid itself, at some distance from the surface.

It would be easy, in Europe, to make some experiments on the *Cadou* itself, as there would be no difficulty to have it sent from the Indies. These fruits come very cheap, as you get about thirty of them for one *sol* of our money.

The reason for buffalo milk being put into the infusion in preference to cow's milk is because the former contains more fatty matter and is more oily. The milk produces in cloth much the same effect as gum and other preparations used on paper to prevent the ink from spreading. In fact, I tried painting a cloth prepared only with *Cadou* with some of our ink and found that it spread much and soaked through to the other side of the cloth. The same thing happens with the black colour used by the Indians.

It is yet to be noted that not every wood will serve for beating and smoothing cloth. The wood that is generally used for the purpose is the tamarind, or another tree called *Porchi*, because they are exceedingly close grained and compact when old. The piece of wood employed for beating is called *Cottapouli*—round, about a cubit in length, as thick as one's leg, except at one end which is used as a handle. Two men seated opposite each other beat the cloth as they think fit ; soon appearance and experience indicate when it is sufficiently polished and smooth.

II

We next come to the drawing of flowers or other designs upon the cloth so prepared. Our native workmen use nothing special beyond the pounce of our embroiderers. Having carefully made his design upon paper, the painter pricks the main outlines of it with a fine needle, then lays his paper on to the cloth and passes over it the pounce (a little bag of charcoal powder), which penetrates through the pricked holes, and by this means the design is transferred to the cloth. Any sort of charcoal will serve, with the exception of that of the palm tree, which in the opinion of the natives tears the cloth. With a brush or pencil he then touches up the outlines with black and red as required, and in this way the design is completely effected.

III

The next thing is now to paint or pencil the colours on the outlines of the design.[1] Black is the first to be applied—a colour not in much use, except for certain lines and for the stalks of the flowers. It is prepared as follows :

1. Several pieces of iron dross are taken and shaken one against another so as to get rid of the less solid matter, leaving large pieces of 9 or 10 times the size of an egg.

2. Then, in addition, five or six pieces of iron (whether old or new does not matter).

3. Having made upon the ground a heap of the iron and dross, a fire is lit on it, banana leaves being the best fuel ; when dross and iron are red hot, they are drawn out and allowed to cool.[2]

1 Here Coeurdoux repeats himself, as in the preceding section he already describes the designing in black and red.

2 This treatment produces the iron oxide necessary for the further operations.

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4. The iron and dross are placed in a vessel holding 8 to 10 pints, and hot *Canje* (the water in which rice has been boiled) is poured over them, taking care that it contains no salt.[1]

5. They are then exposed in the sunlight, and after a day's interval the *Canje* is poured out and the vessel refilled with *Callou*, i.e., palm-tree or cocoanut wine.

6. The vessel is again put out in the sun for three or four consecutive days, and the colour which serves to paint in black is now ready for use.[2]

Certain things must be observed in the preparation. The first is this : more than four or five pieces of iron must not go with eight or nine pints of *Canje* ; otherwise the dye will redden and cut the cloth. The second concerns the quality of the palm and cocoanut wine, which readily sours in a few days, when vinegar is made of it and used in the place of yeast to leaven pastry. The third is that the wine from the cocoanut tree is preferable to that from the palm tree. The fourth is that, in default of such wine, *Kevarou* is used. This is a small seed of the country and a source of nourishment to many. In colour and size it strongly resembles turnip seed, but the stalk and leaves are quite different. They also use *Varagou*, which is another fruit of this country, and preferred to *Kevarou*. About two handfuls are pounded, then boiled, then emptied into the vessel over the iron and dross. Raw palm sugar (about the size of a couple of nutmegs) is then added, taking care not to exceed this amount, as then the colour would not last long and eventually disappear in bleaching. The fifth is that, to make the colour more brilliant, the *Kevarou* or the *Varagou*, prepared as I have just said, is added to the *Kallou*. The sixth and last observation is that the dye will not appear a deep black, nor will it last, unless the cloth has been treated with the *Cadou*.[3]

IV

Having pencilled and painted with black all the places where this colour is needed, they then pencil in red the flowers and other designs requiring to be finished by that other colour. I say ' pencilled ' because at this stage it is too early to paint in red—the blue, which requires much preparation, having first to be applied.

First place the cloth in boiling water and leave it for half an hour. If two or three *Cadous* are now added, the black will become deeper. Next, having diluted sheep's or goat's droppings in water, submerge the cloth in it, and leave it for the night. It must be washed next morning and exposed to the sun.

When asked the reason for this last operation, native painters all agree in saying that it serves to deprive the cloth of certain characteristics derived from the *Cadoucaie*, which, if they remained, would cause the blue when laid on to become black.

Yet another reason for the necessity of this operation is to give a better white to the cloth (which, as we said, was only half bleached at the beginning of the process). When exposed to the sun, it is not left to dry entirely, but sprinkled with water from time to time during one day. Then it is beaten on a stone at the water's edge, not with a beetle as in France, but in the Indian way, which is to fold it over several times and strongly strike it against a stone in much the same way as blacksmiths and farriers strike their heavy iron hammers on the anvil.

When the cloth is sufficiently beaten on one side, it must then be beaten on the other in the same way (twenty or thirty strokes are enough for the present operation). When finished, the

1 Salt would have prevented fermentation of the liquid which has to turn acid, thus cleaning and preparing the iron for the following operation.

2 The product is iron acetate, the well-known black mordant. The Telingas call it cassim (Bancroft).

3 This observation is quite correct, see footnote 2, p. 105. It may be added that iron mordant without tannin gives a brown colour with chay, and a greyish lilac with madder, as remarked in 1900 by the well-known Swiss manufacturer and historian Jenny-Trumpy. (The shades vary of course with the degree of concentration of the mordant employed.)

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cloth is dipped into rice *Canje*. The best way would be to take some *Kevarou*[1] (if procurable), pound it and put it in water on the fire (as if with the intention of boiling it), and, before it thickened much, dip in the cloth, take it out immediately, dry it, and beat it with the *Cottapouli*, as in the first operation for smoothing.

As the blue is not painted on with a brush but applied by dipping into a prepared indigo bath, the cloth must be painted or gone over with wax everywhere, except in the places which are black or are to be blue or green. This wax may be put on with an iron pencil as lightly as possible on one side only, taking care that only the parts I have mentioned remain without wax ; otherwise blue spots would appear there which could not be blotted out again. When this is done, the cloth (waxed in this way) is exposed to the sun ; and careful attention must be given that the wax only melts just sufficiently to penetrate to the other side. It is then quickly drawn away, turned over on the other side, and then strongly rubbed by the hand. The best way would be to use a brass vessel with a round bottom ; thus the wax would spread everywhere and even to the places which, on the other side, must be dyed blue.

The preparation being now completed, the painter hands over the cloth to the blue dyer, to be returned at the end of a few days ; for it must be noted that they are not ordinary painters but special workmen or dyers who look after this particular dye.[2]

Having asked a painter if he knew how indigo was prepared, he told me that he had this information, and explained it in the following manner, which you will perhaps be pleased to compare with the method used in the American Islands.

Here they take the leaves of the *Averei* or *Indigo-Plant*, which, after having been well dried, are reduced to powder. This powder is placed in a big vessel full of water and whipped strongly in the sun by a bamboo split in four, and whose four lower ends are spread far apart. The water is then allowed to run through a small hole in the bottom of the vessel, where the indigo is deposited. It is taken out and divided into pieces about the size of a pigeon's egg. Cinders are then spread out in the shade, and a cloth laid over them upon which the indigo is allowed to dry. It is now ready for use.

After this, it only remains to prepare it for the cloths which require dyeing. Having powdered a certain amount of indigo, the workman puts it in a large earthen vessel full of cold water, adding a proportionate quantity of lime similarly reduced to powder. He then smells the indigo to detect sourness, and in that case sufficient lime must be added until the the odour is lost. Then, taking about a quarter of a bushel of *Tavarei* seeds, he lets them boil in a pail of water for a day and a night, taking care that the cauldron is always full of water. Then he pours out the whole (water and seed) into the vessel of prepared indigo. This dye is then left for three days, care being taken that the whole is thoroughly mixed by stirring it up four or five times a day with a stick. If the indigo is inclined to smell sour, a certain amount of lime must be added.

The blue being thus prepared, the cloth is dipped into it after having been folded in two, so that the right side is outside and the wrong side inside. It is left to soak for about an hour and a half, then taken out—dyed in blue in the right places. It is thus seen that Indian cloths deserve to be called ' dyed ' quite as much as ' painted.'

The length and number of all those operations for dyeing a blue gave rise in my mind to a question (quite natural, as it seemed), which I submitted to one of the painters whom I was consulting. ' Would it not be better,' I suggested, ' to paint these blue flowers with a brush, the more so since there are but few of this colour in your design ?' ' Doubtless it could be done,'

1 *Eleusine coracana*, in tamoul Kevarou, a sort of black millet, eaten like rice in Pondicherry. This finishing treatment has the same effect as the European starching and mangling. It renders here more easy the subsequent application of the wax resist on the cloth.

2 Beaulieu does not tell us that the blue-dyeing was done by another set of craftsmen. This is a curious omission as indigo dyeing was generally reserved, in India, to a special class of people, owing to religious considerations.

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he replied, ' but blue painted on in this way would not last and would disappear after two or three washings.'[1]

I put to him another question as to what cause he attributed the tenacity and adherence of the blue colour ; without hesitation he replied that it was due to the *Tavarei* seeds (I had already been given the same answer by another painter). This seed belongs to this country, although it is not found everywhere. It is light brown or olive green in colour, cylindrical, the length of one line, and split, as it were, at each end. It is difficult to break with the teeth, insipid in taste, leaving a slight bitterness in the mouth.[2]

V

After the blue comes the painting of the red. First of all, however, the cloth must be deprived of its wax ; then it must be bleached and prepared to receive this colour. This is how the wax is removed : the cloth is placed in boiling water so that the wax melts ; the fire is then reduced so that the wax can more easily float, and as much as possible is drawn off with a spoon ; then the water is reboiled, so as to get away what wax remains. Although the wax will have become very dirty, this does not prevent it from being put to the same use again.

To bleach the cloth, it is first washed in water, then beaten on the stone nine or ten times, then steeped in other water diluted with sheep's droppings. Then it is washed again and hung for three days in the sun and lightly sprinkled with water from time to time (as I said before). Then a species of earth named *Ola*, which is used in bleaching cloths, is diluted in cold water, and the cloth is steeped in it for about an hour. Fire is then lit under the vessel, and when it begins to boil, the cloth is taken out and washed in a pond, at the edge of which it is beaten about four hundred times on a stone, and then strongly wrung out. It is next put for a day and a night to soak in water diluted with a small quantity of cow or female buffalo dung. It is then taken out and washed again in the pond, unfolded, hung half a day in the sun and lightly watered from time to time. Once more it is put on the fire in a vessel filled with water ; and when the water has just boiled, it is taken out to be washed again in the pond, beaten slightly and then dried.[3]

Lastly, to adapt the cloth to receive and retain the red colour, the operation of the *Cadoucaie* (described in the beginning) must be repeated. That is to say, the cloth must be steeped in a simple infusion of *Cadou*[4], then washed, beaten on a stone and dried. It is then steeped in buffalo milk, stirred and rubbed by hand for a certain time. When perfectly saturated, it is taken out, wrung and dried. Then it is that, if the red flowers require any white touches to represent pistil, stamen, or other characteristics, these places are pencilled with wax ; and afterwards the red (which has been previously prepared) is painted on with an Indian pencil or brush. The painting in red is usually done by children, as this kind of work is less strenuous, unless a more perfect work should be wanted.

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1 This is well observed, as indigo dyes only in the reduced state of white indigo. This soluble white indigo, fixed on the fibre in the vat, turns blue by oxidization when exposed to the air. It is then already again in an insoluble state and cannot therefore be fixed fast on the cloth.

2 The insoluble commercial blue indigo was at that time reduced (see above) by fermentation due to certain seeds, and lime. Other old French reports about indigo in South India mention the *tamoul tagrevéré* or *tagaraviré* (cassia-tora, an acacia tree), called also *tantipautoulon* in Masulipatam, maybe this plant and *tavarei* are identical. Still in 1881 exactly the same manner was practised in Pondicherry for the reduction of indigo, i.e., *tagrevere* and lime (Bull. SIM 1881., p.271).

The fastness of the blue has of course nothing to do directly with the seed itself, which can be replaced by any other appropriate agent.

3 We have seen at the beginning that the design has been pounced with charcoal and the lines pencilled with the black and red mordants. During the severe treatment of the cloth just described, it is obvious that the design would be bound to disappear and have to be drawn again, had it not undergone a first maddering. Thus it is nearly certain that Coeurdoux missed one of the two red-dyeing operations which we duly find in Beaulieu's report.

4 Coeurdoux wants to repeat here what he said " at the beginning ", but whilst he first describes only one operation, the buffalo milk bath containing an astringent, he is now more complete and his new indications—soaking in a dilute aqueous astringent solution followed by the passage in milk—correspond to those given by Beaulieu. This is another proof that the Father's text must be read with some caution. Beaulieu mentions only a second treatment with milk, not with cadou.

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We now come to the way in which the red has to be prepared. Take some 'hard' water,[1] that is to say the water of certain wells having this quality. Put two ounces of powdered alum into two pints of water; add four ounces of the red wood called *Vartangui* or *Sapan* wood,[2] also reduced to powder. The whole is then put in the sun for two days, taking care that nothing sour or salt should fall into it, as the colour would then lose much of its strength. If the red is required darker, more alum is added. If, on the other hand, it is wanted lighter, more water must be poured in ; and in that way the various shades and gradations of this colour are effected.

VI

To make a colour of the shade of dregs of wine inclined to violet, take one part of red (just described) and an equal part of black, the composition of which has previously been given. Add an equal part of rice *Canje* that has been kept for three months, and this mixture will produce the colour in question. There is a ridiculous superstition prevailing amongst many gentiles relating to sour *Canje*. He who has it may use it himself every day of the week ; but on Sunday, Thursday, and Friday he will refuse to supply others who might be in need of it. To give on these days, they say, would be driving their god from their house. If no sour *Canje* is available, sour *Callou* or sour palm wine may be used.

VII

Different colours derived from red can be composed, but it is useless to enumerate them here. Suffice it to say that they should be painted on at the same time as the red, that is before passing to certain operations I am about to describe after some remarks on what has gone before :

1. Wells giving ' hard ' water are not very common, even in India ; often only one is to be found in a whole town.

2. I have tried this water and have not found the taste ascribed to it ; but it appears to me to be inferior to ordinary water.

3. This water is used preferably to any other, according to some, to make the red finer and according to others more generally, it is an absolute necessity, as otherwise the red would not hold.[3]

4. It is from Achen that good alum and good Sapan wood are brought to the Indies.

Whatever virtue ' hard ' water may have in rendering the red adherent, this colour will neither hold sufficiently nor satisfy as to appearance unless the dye of *Imbouré* is added, more commonly called *Chaiaver* or *Chaia* root.[4] But before putting it into work, the cloth must be prepared by washing it in the pond in the morning, plunging it in several times so that it imbibes the water, which is the principal object and does not happen quickly because of the greasiness of the buffalo

1 The French word is "âpre ", harsh, and it is difficult to know what Coeurdoux exactly meant by this term. The said water must most probably or even certainly have contained calcium, thus being hard. Indeed the presence of calcium is indispensable for obtaining a good fast red, the components of the lake formed on the cotton fibre being alizarine, aluminium and calcium. The first comes from the madder or madder-like plants, the second from the alum used as mordant, and the third is either in the plant itself having grown on a calcium containing soil, or is added to the dyeing bath, or comes from the water used.

This water problem had also been discovered by the European printers. In 1761 for example, the Mulhouse manufacturers Eck, Schwartz & Cie had to dismiss a newly engaged colorist because he could not succeed in getting good reds, and he gave as excuse for his failure that he did not know well the quality of the water he had to employ. In 1775 a printer left Normandy for Alsace where he was unable to get the colours he was accustomed to produce. After having made tests in every direction he finally discovered (1776) that the mountain river running through his factory lacked calcium.

2 The aluminium mordant is colourless, so it must be slightly tinted to the effect that the painter sees what he is doing. The iron mordant, on the contrary, is yellow-brown.

3 See footnote 1.

4 Called *tscherivello* by the Telingas, *chay*, *che*, *chayaver*, *sayaver*, *imbourel* by the Tamuls (Bancroft). *Oldenlandia umbellata* has the same properties as the European madder. Father Coeurdoux commits here the somewhat astonishing error of thinking that the red comes from the Sapan wood which in reality gives only a tint to the alum, the latter being here the indispensable drug.

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milk in which this cloth has previously been put. It is then beaten about thirty times on a stone and half dried.

While the cloth is being prepared, it is necessary to prepare as well the *Chaia* root, which is done in the following way : take some of the root (well dried) and reduce it to a fine powder by pounding it well in a stone mortar (it is expressly recommended not to use a wooden one), adding from time to time a little ' hard ' water. Take about three pounds of the powder and put in into two pails of ordinary water at tepid heat, taking care to stir up the whole a little with the hand. This water will become red, but it will only give the cloth a somewhat dirty colour ; thus it only serves to give the other red colours their final perfection.

To do this, plunge the cloth into the dye and, in order to fix the colour, stir and turn the cloth ; on every side for half an hour while the fire under the vessel is being increased. When the hand can no longer stand the heat of the dye, those who are desirous of the highest style of work never fail to take out the cloth, then to wring and dry it well. The reason is this : in painting red it is difficult to prevent splashes in places where they ought not to be. It is true that the painter takes them out with his finger as far as possible, very much in the same way as we do when a spot of ink falls upon our writing paper. But there always remain spots that the *Chaia* dye renders at first more apparent. That is the reason why, before any further process, the cloth is taken out and dried (as I have said). The workman then seeks for these spots and removes them as best he can with a lemon cut in two.

The spots having been taken out, the cloth is again put into the dye and the fire increased until the hand can no longer bear the heat ; care is taken to stir the cloth in every direction for half an hour. Towards the evening the fire is increased and the dye boiled for half an hour. The fire is then extinguished, and when the dye is lukewarm, the cloth is taken out, wrung vigorously, and kept moist until the next day.

Before passing on to other colours, it is as well to say something about the *Chaia*. This plant grows wild, but it is also sown according to needs ; it rises only to about half a foot from the ground ; its leaf is a clear green, about 2 lines in width and 5 to 6 in length. The flower is extremely small and bluish. Its seed is scarcely bigger than that of tobbacco. This little plant sometimes sends down its root nearly four feet into the earth, but this is not the best, as a 1 ft. or 1½ ft. root is preferred. This root is extremely slender ; and though it penetrates far in the earth, and very straight, it only throws right and left the fewest and smallest of rootlets. Yellow when fresh, it becomes brown when dried up ; and then only will it give a red colour to water. Here I noted an astonishing particular : I had steeped some in water, which had become red ; but during the night the water was accidentally overturned. Next morning I was much surprised to find collected at the bottom of the vessel some drops of yellow liquid. I suspected that some strange body had fallen into the liquid and had caused the change in colour. I spoke about it to a painter, who replied that it only proved that the *Chaia* I had used was of good quality, and that when workmen powder this root, adding a little water (as explained before), it is quite common for it to take a saffron tint. I also made another observation : to the outside of the over-turned vessel a film of a rather fine violet colour was attached. This plant is sold dry in packets ; its upper part with the dried leaves is cut off, and only the root is used for the dye.

As the cloth has been entirely plunged into it (the red dye), and must have thoroughly absorbed it, it has now to be drawn out without any fear that the reds are going to be damaged by the following operations. They are the same as those which we have already spoken of : i.e. the cloth has to be washed in the pond, beaten ten or twelve times on the stone, bleached with sheep's droppings, and, on the third day, washed with soap, beaten, and allowed to dry while water is lightly thrown upon it from time to time. It is left damp during the night and again washed next morning and dried as the day before. At noon it is finally washed in hot water to remove soap and any filth attached to it, and then well dried.

VIII

If a green colour has to be painted on the cloth, like preparations have to be made, which are these : take a *palam* (or a little more than an ounce) of *Cadou* flower,[1] the same amount

[1] This is no real flower, as explained in the Coeurdoux letter of 1747 (see the following translation).

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of *Cadou*, a handful of *Chaiaver*, and, if you require a very fine green, add the rind of a pomegranate. Having reduced these ingredients to powder, put them in three bottles of water, which has to be boiled until it has lost three quarters of its volume. Empty this dye into a vessel, straining it through a cloth. Into each bottle of the dye put half an ounce of powdered alum; shake the bottle for some time, and the colour is completed.

If this colour is painted upon blue, you will get green. For this reason, when the workmen dyed the cloth blue, he took care to avoid painting with wax the parts of the design intended to be green, so that the cloth previously dyed in blue should afterwards be fit to take the green. It is quite necessary to paint on the blue, as nothing but a yellow colour would result from painting on a white cloth.

I must, however, warn you that this green will not hold like the blue and the red ; in fact, after the cloth has been washed four or five times, it will disappear, leaving in its place only the blue upon which it was applied. There is nevertheless a means of fixing this colour so that it will last as long as the cloth itself. Here it is : take the bulb (*l'oignon*) of the banana-tree, pound it while fresh and extract the juice. Into each bottle of green dye put four or five spoonfuls of this juice. The green will now become permanent and indelible, the only drawback being that it will thereby lose part of its beauty.[1]

IX

It now remains to speak of the yellow colour, which does not need lengthy explanation. The same colour which serves for green by painting on blue does for yellow by painting on a white cloth. But this colour is not permanent, disappearing after a certain amount of washing. However, if only they are lightly soaped, or rinsed in sour whey mixed with lemon juice, or steeped in water containing dissolved cow dung, and which has been sifted through a cloth, these fickle colours will last very much longer.

X

Before concluding, a word must be said as to the Indian pencils. They are nothing but a small piece of bamboo wood sharpened and split at the end for a distance of a finger-breadth from the tip. Fastened to it is a small portion of stuff, saturated with the colour it is desired to paint, which is squeezed out by the fingers. The pencil used for painting wax is of iron, of length equal to three finger-breadths or a little more ; it is slender at the top, by which it is inserted into a small stick serving as a handle. It is split at the end and forms a circle in the middle, around which is fixed a ball of hair about the size of a nutmeg ; these hairs absorb the hot wax, which trickles little by little from the extremity of this sort of pencil.

I have now, my reverend Father, set out everything I could ascertain respecting the painting of Indian cloths. I do not know whether I shall prove more fortunate than others before me in this direction. As, however, they would not be conversant with the native tongue, indispensable for dealing with the painters, nor accustomed to their ways, and since their very condition must naturally give rise to a certain mistrust in these timid natives, I doubt whether they could have successfully carried out the orders imparted them in this matter. Not that I should wish to guarantee the truth of everything I have been reporting to you, as it would be difficult to allow no error or misconception to creep in when information has to be sought from those who know better how to work than how to explain. However, as I did not confine myself to a single painter but consulted several, and since it would not have been easy for them all to have unknowingly conspired to deceive me, it is scarcely likely I have strayed very far from the actual truth. I am, etc.

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1 The Father is here of course much too optimistic. If the banana recipe had been something serious, the yellows and greens thus produced on the old Indian painted cottons would have come down to us, unchanged, which, alas, is not the case.

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A LETTER FROM FATHER COEURDOUX, A MISSIONARY OF THE COMPANY OF JESUS, TO FATHER[1] . . . OF THE SAME COMPANY

Pondicherry, December 22nd, 1747

My Reverend Father,

I do not know whether the letter I wrote in 1742 on the painted cloths of India can prove of any assistance in perfecting the art of Painting and Dyeing in Europe ; that, at least, was the aim I had in mind. Since then I tried here to arouse the fancy of some persons able to improve on what I said on these matters and to add some new and useful knowledge. Among others I applied to M. Lepoivre, late of the Foreign Missions, whom the misfortunes of war had brought to Pondicherry in 1746. A bullet had carried off his right arm ; but in his left one he found the whole of that ability for painting which he was apparently to lose in consequence of such sad accident.

As soon as he was in this city, he became acquainted with what I had written on cotton painting, and, having undertaken to put it into practice, he succeeded in doing so. I then urged him to set down in writing his considerations and remarks, whether they were consistent with mine or opposed to them, assuring him that they could only be most welcome to me since they would contribute to perfect some arts which, anyway, were not of my calling. If his civility prevented him from acceding to all I requested and to criticise me as much as I could have wished, my entreaties have at least produced the letter I am forwarding you. In its brevity it contains many judicious observations, which will doubtless give a real pleasure to the lovers of the fine arts, if you would impart them to such persons.

A Letter from Monsieur Lepoivre to Father Coeurdoux

My Reverend Father,

My first attempt to paint after the Indian fashion has at last come to an end. I should have finished sooner had it not been for that laziness and tardiness the workers of this country can never get rid of. I had to use much forbearance in order to watch them in all their proceedings ; thus it did not depend on me to satisfy you earlier on behalf of the observations you did me the honour of requesting from me.

In my first performance my aim was not only to acquire some knowledge on the way the Malabars[2] paint their fabrics, but also to make several experiments in order to find out whether the drugs they resort to, and which we do not possess, could not be supplied in Europe.

I even followed the method by which they work and of which they are slaves only as far as I deemed necessary to get acquainted with it and to know it ; indeed I often deviated from it to see whether success could not be achieved by some other means, and whether more accomplished results could not be obtained more simply.

I must confess that on many points I have been but moderately successful ; on some others I failed entirely ; sometimes I have been more fortunate. That is the fate of those who are first in undertaking something new and who, wishing to perfect some imperfect craft, begin by

[1] Coeurdoux's usual correspondent, Father du Halde, died before 1747, and at the time of writing his successor was unknown.

[2] Mr. John Irwin explains to me in a letter M. Le Poivre is here misusing the term ' Malabar ', and that he really meant ' Tamil '. Such misuse was common among Europeans and derived from the fact that when the Portuguese first settled on the Coromandel Coast they were under a mistaken impression that the language of this area (Tamil) was the same as that of the Malabar coast of S. W. India and therefore called both 'Malabar '. This misapplication persisted long after the true facts were known and is mentioned in Sonnerat, *Voyages*, Paris, 1781, vol. I, p. 47: " Les habitants de la cote de Coromandel sont appellés *Tamouls :* les Européens les nomment improprement *Malabars*."

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throwing off the yoke of custom and freeing themselves from the ordinary rules. Here are then the remarks my first attempts have provided me :

1. I must do justice to the research work you carried out on the way Indians paint their cloths. Your findings are very accurate and quite precise. Lovers of the fine arts ought to be deeply grateful to you for the new knowledge you imparted them on the matter. I find that your Letter explains quite clearly and with a good many details the various proceedings of our method of painting. I would only wish that you could give in Europe a more distinct notion of the different drugs that enter into calico painting here. If you could, therefore, get some moment of leisure in your apostolic work, you would render a genuine service to our interested people in Europe by giving them some new explanation on the fruit you call *Cadoucaie*, and on the plant you have already acquainted them with under the name of *Chayaver*. These are the two most essential ingredients, the ignorance of which might impede the success of those who, in Europe, should desire to imitate the painting work of India.

2. The *Cadoucaie* is a genuine Myrobolan, of which, as you know, our druggists distinguish five species : the citrine Myrobolan, the Indian or Black Myrobolan, the Chebule, the Emblic and the Belleric Myrobolan. Our Malabars use only the first two species, which contain much essential salt and oil. After having crushed them, they mix them with some cow-buffalo milk. This kind of milk is not absolutely necessary. I have found that cow milk produced the same result. If it is the unctuosity of the former that, in this country, makes it to be preferred to the latter, the same reason does not hold in Europe, where cow milk is much more unctuous than any milk likely to be found in India.

3. I do not think that colour adherence must be attributed to that first preparation to which cloths are submitted here ; it serves solely to render them susceptible to take on any colour that may be applied afterwards, and which otherwise would get too flat or extend too much, more or less as our ink does on paper insufficiently aluminized. Like the Indians, the Chinese own the secret of painting on cotton, at least in red. Before they set to work, they do not give their fabrics any other preparation as the one they give their papers, i.e., steeping them in a mixture of alum and very light glue. Their products are no less indelible, though they use neither *Cadou* nor buffalo milk. I therefore am of opinion that the *Cadou* has no other use but that of blackening that first dash which the Malabars use to mark their design first after having pounced its pattern. Indeed I have observed that this drug, an explanation of which you give under article 3, is at first just a reddish water, charged with vitriolic parts, and which gets black only when applied on the preparation of *Cadoucaie*. Thus the gall-nut will produce the same result.[1]

4. I made one more experiment, in which I succeeded : our European fabrics are as susceptible as Indian ones to the same painting. I painted a white handkerchief of common cloth[2] from Brittany with the preparation of *Sapan* wood, and the result was excellent. I had the handkerchief washed several times and its colours remained equally brilliant ; I shall send it to you so you may judge by yourself.

   I believe that instead of *Sapan* wood you could use to better advantage the dye of *Pernambuco* wood or even of *Cochineal :* the latter would bring about infinitely better results than any obtainable by means of the *Sapan* wood, which is exactly the same as the one called in France *Brazil* wood. I made an attempt with some Carmine which, although entirely spoilt, gives the cloth as much brightness as the freshest Indian paintings.[3]

1 The Chinese painting on cotton seems to have nothing to do with the Indian manner of dyeing mordants, and the comparison made has thus no sense. But the observation about iron mordant getting black in contact with cadou is quite correct (see footnote 2, p. 105).

2 The French word " toile " has most probably to be taken here in the sense of a linen cloth, as this fibre was woven in Brittany. It is regrettable that the Le Poivre sample is no more available, as Sapan wood does not dye very fast, and linen is not so easy to dye as cotton.

3 Cochineal, an animal mordant-dye, yields in fact far better results regarding fastness than the decoctions of the said woods. Maybe " entirely spoilt carmine " refers to cochineal.

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5. With respect to the *Chayaver*, of which I have the honour to send you one plant, drawn and painted from life, it is visible that colours, at least the red one, owe their adherence and tenacity to its roots. Until the painted cotton has been boiled in a decoction of that root, it is impossible to entrust the freshly painted cloth to the laundryman, for the colour will fade ; it does not get adherent until it has been sufficiently imbibed with the alkaline salts of that root.[1]

In my opinion, this plant is nothing else but what Mr. Tournefort calls *Gallium album vulgare*. The description that learned botanist gives of his plant is exactly the same as the one that could be made of the *Chayaver*. In any case, even if the two plants be different, they have one common effect, which is to curdle milk : I myself made the experiment.

These are, Reverend Father, all the observations I could submit on the way the Indians paint their cloths in Pondicherry ; if you consider them appropriate, they may help the purpose you have in bringing to Europe the secret of the Indies. It is surprising that, so far, there should not have been in this country any European interested in the matter, endeavouring to enrich his own country with an art from which so much advantage could be drawn.[2] It is to be wished that, when leaving their countries, our travellers would not forget it so often. There are but few peoples who do not own some particular art or craft the knowledge of which might be useful to Europe. Discoveries of such kind would be of more profit than an infinity of exaggerated and not over accurate reports by which those who travel expect to entertain the public. So far, Your Reverend Fathers, and above all those working with the China Missions, have been the only ones to give us an example of such useful pursuit. The pains they have taken to find out the way the Chinese work the porcelain, cultivate the mulberry-trees and feed the silkworms deserve the gratitude of all their countrymen, whom they have so usefully served. Why does such beautiful example encounter but so few followers?

I trust, Reverend Father, that if you have made some new discovery, you will be so kind as to apprise me of it with the same frankness as I am informing you of mine.

I have the honour to be with my deepest regard,
Reverend Father,

Your very humble and most obedient servant,

LEPOIVRE

This letter induced me to do some research work and to formulate some new considerations which may, too, be of some utility. Here they are:

1. Although the *Cadoucaie* is the first of the Myrobolan species of our druggists, the Indians, unlike them, do not range it under the same name as that of fruits produced by quite different trees.

2. Just as we distinguish green walnuts and ripe ones, so do Indian dyers and merchants discriminate between the *Pindjou Cadoucaies*, i.e. those gathered while still green and tender to be dried in this condition, and those that have been left to ripen before being taken off. At sight, they seem to be very different, but they are undoubtedly fruits from the same trees.

3. The reason for this distinction and for the different styles of gathering *Cadoucaies* arises from the differences found in the hard waters suitable for dyeing, which have

1 There is of course no saturation of the cloth with alkaline salts of the chayroot. The dyeing principle is the alizarine contained in the root, (see footnote 17, first Coeurdoux letter). If a freshly painted cotton would be sent to the laundryman it is only the tint given to the mordants which would disappear, this tint having absolutely nothing to do with the subsequent colouring of the mordants in the madder bath.

2 The Indian method was introduced in Europe, as far as we know, already in the last quarter of the 17th century, and the " surprising fact ", one can say, is that Le Poivre knew nothing about this western industry !

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been mentioned elsewhere, and which are not absolutely the same everywhere, nor of the same quality, and the deficiency of which must be made up by some more astringent *Cadoucaies*, collected prior to their maturity.

As an instance, the quality of the waters of Madras, the former English colony, very famous in the Indies, and taken by the French in 1746, requires the use of *Pindjou Cadoucaies ;* whereas in Pondicherry one must use those gathered when ripe. Not all Indian dyers agree that it is this lack of a certain degree of hardness of the waters that obliges to resort to *Myrobolans* gathered when still tender ; some dyers claim on the contrary that, *Pindjou Cadoucaies* having, as they, say less harshness than well ripened ones, they require the use of harder waters. Be that as it may, it is rather astonishing that the Indians should have discovered in the difference of maturity of those fruits a means for making up for the deficiency of some waters, suitable in other respects for dyeing and painting.[1]

These *Pindjou Cadoucaies* are so much the better as they are smaller. Some of them are scarcely 6 lines in length. Some are of a brown colour, some others quite black ; but this difference in colour is only accidental and does not indicate different species. As they have been gathered when still green, it is not surprising that, after they have dried, their surface is entirely covered with wrinkles. But as it requires much more work to gather and to dry them, their price is much higher than that of the well ripened ones.

4. We must range among the *Pindjou Cadoucaies* one kind of *Myrobolans* that are brown or black like the small ones I just mentioned, but bigger and larger than those used by Pondicherry painters, although they have been gathered when ripe. I was at pains to believe it, but an Indian painter convinced me of it by breaking in my presence one of those big *Cadoucaies* and its core, showing me its badly fed pulp, covered with a brown skin ; whereas a well ripened *Cadoucaie* which he broke too had in its core a well conditioned pulp, as white as an almond. The reason for this difference is that one same sort of *Cadou* tree comprises several varieties, the fruits of which are of different sizes, as our apples are not all equally big, conformably to the different species of apple-trees bearing them.

This is what I learnt from a drug merchant of this country, whom I consulted on the matter ; for it is only by dint of many questions put with much patience to several persons that one may hope to get from those people what one should like to know ; this is, however, not always a loss of time since one man informs you of some circumstance that may have escaped the other. The difficulty is, sometimes, to reconcile them when their opinions differ and their statements are contradictory. Further queries addressed severally to other people and a redoubling of patience permit at least to discover on which side lies the truth.

My merchant added that those big *Cadoucaies* came mainly from the Northern Provinces, and that the ones from Surat were of that kind as well ; and he also confirmed me in what I said before on the evidence of the Indian painters, namely that the *Cadoucaies Pindjou* as well as those other ones gathered only when well ripened were absolutely the same fruits and from the same trees, assuring me that in his youth he had travelled to the West of Pondicherry and up to the mountain range near the Malabar Coast where these fruits are brought from, and that he had seen them being gathered.

5. I must not omit to mention here another product from the *Cadou* tree called by them *Cadoucaipou*, i.e. blossom of *Cadoucaie*, although it is anything but its blossom. It is a

1 This passage is remarkable as it shows again the great importance of the quality of the waters employed for the fabrication of painted cottons. As we know nothing about the chemical composition of both the said cadou fruits and the waters used at that time, it is not possible to get a clear idea of the effect of the described proceeding. Anyhow, as here we have no maddering it seems that no calcium problem would exist.

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kind of dry fruit, or simply a flattened shell, often orbicular, the colour of dead leaves outside, and inside a velvety brown. It does not seem to have ever contained anything, unless it be the eggs of the insects that probably gave birth to it, for this kind of nut is to be found on the very leaves of the *Cadou* and is originated in the same way as the gall nut and some other excrescences that appear on the leaves of some trees in Europe.

Some of those *Cadoucaipou* are up to one inch in diameter ; many are smaller; I was also told that there are larger ones, but I did not see them. The description *Lemery* gives of the nux vomica fits them quite aptly. Wondering whether it was not effectively the same, they gave a strong dose of it to a dog, who was not inconvenienced by it. It even seemed to do him good, as it does to human beings, since physicians of the country use it with good results against colics and dysentery by means of some preparations which it would take too long to describe and which are not my subject. It is astonishing that such efficacious drug should not be known in Europe, as I was assured of it by a very intelligent person (M. Mabile, a doctor of medicine).

6. In any case, this sort of flat nut is of great usefulness for cotton painting, and I shall expound the use Indian painters make of it all the more readily since I mentioned it too briefly before for want of the information I was given at a later time. Here are the particulars of the preparation of the yellow colour made with the *Cadoucaipou :*

Take for instance four ounces[1] of it and, without squashing or crushing it, let it soak about 24 hours in some forty ounces of hard water. Place then the mixture on the fire after having thrown on it one ounce of pulverised *Chayaver*. Let it come to the boil three times, taking the fire away when it is boiling and putting it then back to get it to boil three times so that in the end the water is reduced by half. Pour this water into another vase so that the *Cadoucaipou* remains at the bottom of the other one, and when that water has become lukewarm, introduce first one ounce of alum reduced to powder and dissolved in hot water. With the liquid thus prepared, if you paint on blue, you will get a green colour ; if you paint on white cotton prepared with the *Cadoucaie* and the milk as I explained previously, you will obtain a yellow colour. If you want a stronger green, you must first darken the blue on which this yellow water is to pass. To obtain a light yellow, take from this water the quantity needed after it has boiled only once. The yellow will be stronger if you draw out water that has boiled twice. It will be much stronger yet if you let the water diminish by three quarters. To get a darker yellow, you may also paint twice and several times the same spot with the same water. I already pointed out that those colours are not like the red, which grows more beautiful in the laundry, whereas those others fade progressively, the more you bleach the cotton on which they are painted.[2]

7. The *Cadoucaipou* is not only made use of to paint in yellow ; dyers, too, avail themselves of it to dye in this colour, but the preparation of this dye is much simpler. In order to dye for example six cubits of cotton, take four palams of *Cadoucaipou ;* break it into small pieces and let them soak or steep about half an hour in some 16 or 17 pounds of hard water, or even any other water, provided it is neither briny nor brackish. Get it then to boil until it has diminished by about one quarter ; when it has somewhat cooled down, put the cloth in getting it well soaked ; wring it then lightly and let it dry well in the sun.

Furthermore dissolve in 16 pounds of water two palams of alum reduced to powder ; heat it until it is more than lukewarm ; dip then into it the same cloth, which you wring lightly, letting it then dry a second time in the sun. A blue cloth dyed in the same preparation and after the same fashion will be dyed in green. You may also dye yellow with even less preparation and cost. For the same quantity of cloth, take

1 The ounce is the French one, weighing 30.595 g.

2 Coeurdoux seems to have abandoned the banana-recipe for fast yellow (see footnote 1, p. 112).

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one palam of *Cadoucaipou*, which you crush on a stone by means of a cylinder, throwing some water on it so that this ingredient forms a kind of paste. Steep it in two or three pints of water, which you then strain through a rag ; add then three times as much of the plant called *Terramerita*,[1] which is prepared in the same way as the *Cadoucaipou ;* the *Terramerita* from Bengal is preferred to the one growing here. Heat this water, immerse the cloth into it, and it will be dyed yellow after you have dried it not in the sun but in the shade, for otherwise this colour, which is neither beautiful nor adhesive, would soon grow red or brown.

8. M. Lepoivre thinks that the property of contributing to the adherence of colours must be denied to the *Cadoucaie*. On this point I cannot be entirely of his opinion. It has against it the opinion of the Indians themselves ; and, according to the report of M. *Paradis* on red dye, which I shall communicate later on, this fruit is used in dyeing where the question is not at all to gum the cloth as one gums paper to be written on. The example of the Chinese, who paint quite well in red without any *Cadoucai* proves at most that it is an ingredient they lack, or which they replace somewhere, as they have done for the *Chayaver*, which they do not seem to know.[2]

9. In order to decide whether the *Chayaver* is the same plant as the *Gallium album vulgare*, the shortest way would be to send some of its seed to France. If it grew there, one could judge at a glance whether it is the same plant that is to be found in France and in the Indies. If it is the same, M. Lepoivre will have rendered an important service to the dyers by acquainting them with the virtues of such useful plant, which they had available without knowing its uses. Should it not be the same, he will at least have given the botanists some pleasure by revealing them a new *Gallium* or cheese-rennet which, as it seems, has escaped the author of *Hortus Malabaricus*. What makes me somewhat doubtful as to the two plants being the same in spite of these similitudes they may show is the fact that no botanist gives the *Gallium album vulgare* those long roots that, in some way, characterise the Indian *Chayaver*.

Those are, Reverend Father, the observations I made with respect to M. Lepoivre's letter. He has painted from life a *Chayaver* plant, which I have the honour of sending to you ; I believe it may, as well as his letter, be of interest to the persons curious of these matters.

I have the honour to be with my deepest regards in the union of your SS. SS.,
Reverend Father,

Your very humble and most obedient servant COEURDOUX of the Company of Jesus.

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1 Terramerita or Turmeric (Curcuma) is one of the few so-called " substantive dyes " i.e. soluble in water and dyeing directly, but of course the yellow it yields is not fast to light or washing. It is sometimes tried to improve its stability by adding alum and this is the way Beaulieu describes for the use of Turmeric.

2 The Chinese example seems again not relevant. Of course Le Poivre is wrong when saying that the cadou does not contribute to the adherence of the colours. But it must be observed here that his explanations in this regard are somewhat contradictory. For the effect of the cadou see footnotes 1 and 2, p. 105, first Coeurdoux letter.

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APPENDIX "B"

THE METHOD OF PAINTING COTTONS, AS PRACTISED IN INDIA

[This anonymous article was published in the *Journal oeconomique*, Paris, July, 1752. It is here translated and reprinted for the first time.

EDITORS]

THERE can be no doubt but that it would be most harmful to the State were we to neglect our own production of light silken and woollen materials in favour of Persian or Indian cottons. It can, however, only be a good thing to know how these peoples set about applying colours to their cotton cloths, which not only do not run or fade when washed but emerge more beautiful than before. Everyone can see for himself how useful this would be when he envisages what the possibilities could be for our cotton, linen and hemp cloths. Two different methods are used in India which I am about to describe.

According to the first method one takes two rollers, each with a selvedge edge along its length. An iron pin passes right through the rollers, one end of which is fixed and serves as a windlass. This mechanism, similar to what is often seen in wells, for drawing water, is too well known for me to waste time describing here : it may suffice to say that the frames which support the pins are attached in one way or another so that the handles can be stopped completely thus preventing the rollers from turning and slipping. At the selvedge ends of the rollers the piece of cloth is attached at its extremities to fix it permanently, it is rolled round one roller and the workman stands, generally at a distance of about 5 feet[1] from the other and stretches it as much as he can. This cloth has been dipped in water containing a solution of gum Arabic. He has at his side a wooden mould of the width of the cloth and on it is engraved the design to be marked on the cloth, and a large bag or cushion suitable for the mould filled with cotton. Not that cotton is essential but because it is extremely common in India. This cushion is covered with a skin which has already been used.

He smears the skin of the cushion with a very thin paste made from rice starch, indigo and spike oil, which produces a kind of thick ink ; he then presses the mould firmly on it and after having wiped it so that no dye remains outside the lines he applies it to the cloth which thus receives the imprint of the design. Sometimes only Indian ink or roukou is used instead of the composition I have just described. There are experienced and skilled workers with a steady enough hand to draw the lines of the pattern on the cloth with a brush without having to use a mould.

The lines of the drawing are always double, as can be seen in every printed cotton. A second operation consists in filling the space between and this is always done by hand with the brush : into this space they put the colours that they deem appropriate and which are all taken from herbs, leaves, the rind of trees or roots. It may be appropriate to note that it is perhaps just because they belong, like the cloth itself, to the vegetable world that they hold so fast, due to the affinity between them. I very much doubt whether colours drawn from minerals and fossils would be as effective. The colours used are always prepared with spike oil. This is the first manner of making printed cottons.

The second is as follows : a frame is made of planks and placed on the ground, of any convenient or appropriate size. This frame is filled with very pure clay, that is to say it is free of all stones and grit and well kneaded. On this clay suitable patterns are drawn either with simple or heavy strokes and care is taken for the drawing to be everywhere of about the depth

1 The French foot has 32.48 cm.

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of a ligne.[1] This drawing is next filled with colours prepared with spike oil taking great care to see that they do not spill over their hollow and they do not spread over the surface of the mould.

The cloth to be painted is then taken ; it is fixed to the frame with nails along all the selvedge edges and it is very tightly stretched. One must have at hand a vessel with fresh water in which gum Arabic has been dissolved. A watering can with exceptionally fine holes is filled with this liquor and the cloth sprayed with it as lightly as possible. This operation is done out of doors in the sun which completes the work : for the heat of the sun penetrating the cloth, which despite its tautness has sagged from the weight of the water poured on to it, dries it and at the same time removes the moisture from the colours. This moisture, always charged with a light tincture of the colour from which it emanates, and grease from the spike oil, is too thick to pass through the gummed cloth and evaporate. It therefore becomes fixed to the inner surface of the cloth and represents there the patterns that have been drawn and coloured on the mould, never again to disappear.

1 The French *ligne* has 0.225 cm.

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APPENDIX "C"

TRADITIONAL COTTON PRINTING IN INDIA: SOME CONCLUDING REMARKS

P. R. SCHWARTZ

THE previous article (Appendix " B ") seems to be the first and only detailed description ever published on traditional cotton *printing* in India. In Europe, woodblocks engraved *en relief* appeared first, engraving *en creux* having been practised only, it seems, when copperplates began to be largely employed for *camayeu* printing in the second half of the 18th century, after the convenient thickening for the red mordant had been found for that purpose, and a new method of printing indigo had been invented (the second manner of so-called " English Blue").[1]

The Indian methods described in the foregoing article curiously enough refer only to " en creux " engraving. The first description is not very clear. The soaking of the cloth in an Arabic gum solution was most probably to prevent the running of the colours. The handling of a wooden mould to the width of the cloth would represent—if we take a mean of a yard for the latter—a tiresome and inaccurate job due to the weight, the more so as the cotton seems to have been only stretched between rollers, without any table underneath.

The second process described in the foregoing article was carried out experimentally in 1956 at the Musée de l'Impression sur Étoffes, Mulhouse, not with clay but with a copperplate. It was quite successful, the design appearing very well on the inner side of the cloth (crushed indigo and spike oil were used).

In the original account, no allusion is made to the use of mordants and it must be supposed that this printing was only applied, with a sort of ink, for the mere outline and not for the colours—and this only when skilled hand-painters were not available. Moreover, the author takes care to tell us that the filling in of the design with the various colours was always done by hand, and the context seems to leave no doubt about their origin being dyed mordants.

This raises the problem of how the *entirely* printed cottons were traditionally made in India, the fact of their existence being known from documentary evidence of the 17th century and earlier. What do we know about the actual " printing " of cotton in India, either with mordants, resists, or real colours?[2] The famous Dr. Edward Bancroft (1744-1821), who studied cotton printing throughout his life, when describing the manufacture of Indian chintz after Quérelles-Beaulieu and Coeurdoux (and such reliable private information that he had been able to gather from people in India), felt compelled to say that his use of the word " printing "

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1 It may be of interest to state here that, according to a very rare anonymous German book on cotton printing, published in 1768, the inventor of this industry (knowing for one reason that rust stains on cloth are indelible, and for another that iron salts give a black colour with tannin) tried first to fix on cottons prepared with tannin, drawings engraved on metal plates (either " en creux " or " en relief ") with the help of a sort of pap made from an iron salt and flour. No other author seems ever to have made a similar statement, so we know nothing about the origin of the process described for printing a black mordant with a metal plate. (Reproduced from my article on the history of indigo printing in the Bulletin of the Société Industrielle de Mulhouse, 1953, pt. II, p. 78, in. 23.)

2 We can assume that the staining of textiles is as old as weaving. It is indeed easy to apply mineral and vegetable colours on a cloth directly by means of a brush, a block, or a stamp, but the inconvenience is that they generally lack solidity. The production of fast colours, however, necessitates a more elaborate technique: the use of iron and/or aluminium salts (so-called mordants) which have a special affinity for the dyeing principles of certain plants. Pliny (A.D. 23-79) already described the process, the origin and age of which still remains completely unknown.

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discounted the fact that neither mordants nor other tinctial matter used there for dyeing cottons had ever been applied by means of blocks or forms, as in Europe. Only the brush, he remarked, was known in India. This very categoric statement is indeed in contradiction to the documentary evidence already mentioned, and we must admit in this connection that Bancroft the historian was less well informed than Bancroft the scientist. Nevertheless, although we know that two sorts of chintz were made in India—the painted and the printed (the former being always described as surpassing by far the latter in quality)—no reports at all ever reached us regarding either the engraving of blocks or the printing method employed (apart from the account in the foregoing article).

The possible printing with real, but fugitive, colours will be left aside, as the fastness of all Indian chintz was its most celebrated quality. The only information available about block-printing in the East concerns not India, but other countries. For instance, the French traveller Thévenot, who died in 1667, said that he saw in Persia coarse cottons printed with blocks " besmeared with colours ". We do not know if these were actual pigments (evidently not fast) or mordants. For the latter it must be borne in mind that the mordant for black and violet is yellowish, and the mordant for red colourless, the latter being only slightly tinged with red from Sapan wood. Thus, this information is too vague to be taken as evidence for one or the other way of printing cloths.

Already in 1553 another French traveller, Pierre Belon (1517-1564) had published his " Observations " describing the way cotton was printed in Constantinople. Here also the blocks were smeared with " colours ", but judging from the context these must have been actual, not dyed.

In old times, fastness of colours on cotton could only be obtained by the help of mordant (with the exception of indigo blue, which dyes directly in a reduced state of white indigo). These were put either on the cloth or in the dyeing vat itself. From the technical point of view, the following can be said : the printing of a resist with a wood or metal block and subsequent dyeing fast in as many vats as are necessary offers no difficulty (it is the well-known, but very slow, Batik process, as practised in Java). On the contrary, the printing of mordants is quite different from their painting and supposes a much more elaborate technique, and this for the following reason : the best mordant is that which abandons easily a maximum of its metal to the cotton fibre. An aqueous solution of an appropriate natural alum gives excellent results when painted, especially on a cloth prepared with an astringent (tannin) ; but to be printed with a block the mordant must be thickened, and here things change greatly. First of all, the drying of a thickened mordant is a very delicate matter : by numerous operations the thickening agent (starch, gum) must be taken off as completely as possible before dyeing, moreover thickened alum does not abandon its aluminium oxide to the cotton in a way convenient to obtain colours of a high standard. Thus Europe (where on account of labour costs mordants were not painted but only printed) was compelled to look for aluminium salts yielding better results than the available alum, a double sulphate of aluminium and potassium. This led finally to the empirical discovery (second quarter of the 18th century ? Where ?) of aluminium acetate which has all the required properties and has indeed never been surpassed for printing (its thickening remaining nonetheless a real art).[1]

1 Bancroft (*Experimental Researches Concerning the Philosophy of Permanent Colours*, London, 1794, 2nd. edn., 1813) is very affirmative to the effect that still, at the end of the 18th century, the use of aluminium acetate was unknown in India, according to personal information. Even today, as Mr. S. R. Jasani of Ahmedabad was kind enough to tell me (in 1956), only commercial aluminium sulphate is used by the many Indian cotton-printers still practising hand-methods to-day (in combination with chemical dyestuffs, which have qualities other than the old vegetable dyes).

It must be remembered here that alum is a generic term. This salt, already used by the Ancients for various purposes, is either found in a natural state near volcanoes, as a product of weather-beaten minerals, or is man-made by various processes. It crystallizes in two systems, cubic and octædric, the former yielding better results for dyeing than the latter. Its purity was extremely variable, the frequent presence of iron being very harmful to the red. Father Coeurdoux, writing from Pondicherry in 1742, said that good alum came to the Coromandel Coast from Achen (modern Atjeh, North Sumatra). As this island is largely volcanic, the said alum was most probably of volcanic origin.

Whilst drying, it seems that alum abandons its aluminium oxide (which constitutes in fact the active part of

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Mr. John Irwin tells me that there is plenty of documentary evidence to show that the bulk of 17th century Indian chintz exports (at any rate from Western India) were of the kind described by contemporary traders as " printed ". He also says that these " printed " cottons mostly had coloured grounds. However, all such evidence (including the evidence of French reports of the late 17th and early 18th century), while showing that both printed and painted cottons were produced contemporaneously in many parts of India, always stress the fact that the latter were superior in beauty. Could the so-called " printed " cottons, admittedly coarse, have been produced by the resist process, being thus similar to the samples found in Egypt and identified as Indian export cottons of the 12th to 16th centuries?[1] For my own part, I have never seen entirely mordant-printed Indian chintz dating with certainty from the 17th century (or earlier), and I confess I am unable to solve this problem of manufacture.[2] All I can say is that I think that if the cottons were printed with thickened alum, the madder-dyed colours could never have matched those of the painted chintz.

It is a fact that in some old (how old ?) Indian cottons the black outlines of the *borders* show repeats so identical (reproduction of the same defaults, for example) that they must have been block-printed or stencilled. In the latter case, passing a brush dipped in iron mordant over stencil was an easy thing, but did Indian cotton painters do that ? Could crushed indigo and spike oil, when printed, represent a pigment fast enough to undergo without damage the subsequent washings and boilings ? Would it not have vanished like the mentioned *roukou*, which is fugitive in any case? Indeed, only Indian ink would have yielded good results. Or were the lines, on the contrary, printed with iron mordant?

The solution of such technical problems lies in detailed analysis of cottons, the origin and age of which are definitely known. This does not seem to have been yet made with the necessary

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the mordant) more easily to the cloth if this is prepared with a fatty aqueous solution of a vegetable astringent (milk and tannin). This treatment, amongst other effects, prevents crystallizing during evaporation, thus favouring a most complete decomposition of the mordant put on the cloth, which otherwise would produce only faint colours in the chayroot bath (the aluminium acetate used in Europe does not crystallize). The already quoted Dr. Bancroft thought that if the Indians succeeded in obtaining their celebrated bright and fast colours merely by painting plain alum, it was most probably due to the above-mentioned preparation of the cotton, followed by the open-air drying of the mordant through an extremely hot sunshine.

1 The late and lamented R. Pfister (died 1955, if I am well informed) who published in 1938 a very interesting book on these cottons (*Les Toiles Imprimees de Fostat et l' Hindoustan*) as far as the analysis of designs was concerned, seems to have had a strange knowledge of the technique of printing various textiles. His affirmations regarding the resist printed origin of the documents examined lack consistency. Not to speak of his interpretation of the famous Pliny report (discussed in fn. 2 p. 121) on mordant printing in Egypt which, he claimed, could doubtless have concerned only wool. He forgot or ignored that this animal fibre needs no mordant to be dyed in a madder-bath. The mordanted places turn out much brighter, of course, but the unmordanted ones cannot be bleached off again as is the case with cotton. It is this very affinity for dyes which prevented woollen cloth from being printed like cotton, before the so-called " steaming " was discovered, most probably in England in the late 18th century. This process involves the simultaneous printing of the dyestuff and the mordant mixed together with the thickening paste, the development of the colours resulting from a subsequent exposure of the cloth to steam.

The above-mentioned passage of Pliny's *Historia Naturalis*, Book 35, Chap. 11, had already been badly misunderstood by the late Robert Forrer, who saw there a description of a resist technique, forgetting that the indicated boiling of the cloth was bound to destroy any protecting matter. Jenny-Truempy, and Rouffaer and Juynboll, duly picked out this incomprehensible error made by an author specialised in the history of cotton printing.

2 A piece of cloth found in Egypt was reproduced in the *Journal of Indian Textile History*. no. 1, 1955, p. 31. It was given to the Victoria and Albert Museum, London, by R. Forrer, the well-known Strasbourg archaeologist and textile historian, who discovered it while excavating in the Nile Valley at the end of the last century. An identical piece (probably originating from the same source, is preserved in the Musee de l'Impression sur Étoffes, Mulhouse. It happens—fortunately in this case—that the latter sample has a faulty repeat, resulting in the appearance of a white line along the block. We have here the technical proof that the cloth was mordant and not resist-printed. The yellow and the blue are pencilled, the latter most probably applied from the indigo vat in the way described by Beaulieu in Section VI (see *Journal of Indian Textile History*, no. 2, 1956, p. 13). These colours nearly disappeared on the right side of the Mulhouse piece. The red is dirty-dull brick. As it seems, there is no proof either of the age of this cloth or its original provenance (which could possibly be non-Indian, either Turkish or Near-Eastern).

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care. So, for the time being, the question of when and how the Indians began to *print* their chintz with mordants remains open. It has hitherto been generally assumed that this technique was discovered in Europe. Is there any reason to revise this conclusion, and to attribute the discovery to India ?[1]

1 It may be added that a similar problem exists in relation to the printing or painting of indigo (as distinct from vat-dyeing). Who discovered that indigo could be reduced successfully with the help of orpiment and lime? If India was first, then it should be possible to detect arsenic in Indian chintz earlier than the second quarter of the 18th century, and this is a test easily made. Unfortunately the absence of arsenic is not an absolute proof that it has not been employed, as it could well have disappeared during the washing operations following the dyeing.

The recipe of the orpiment vat for printing indigo was already sold, in 1745, under the name of " English Blue ", to his customers, by a German dealer in dyes. According to Dr. Bancroft (*op. cit.*) this vat seems to have been ignored in England still in 1734, as in this very year certain linen resist-printers had offered Dr. Lewis 100 guineas for the discovery of an indigo blue which could be printed. As he had asked for hints before starting his research, they indicated ferrous sulphate and lime. This of course could not have led to the wanted result, but this information is interesting in so far as it can be admitted that at that time the discovery of the copperas vat was not far away. Anyhow, the proportions of the said ingredients indicated to Dr. Lewis were insufficient to provoke the convenient dissolution of the indigo, and the recipes invented by the latter were also bound to fail, according to Dr. Bancroft. I remember here that the discovery of the copperas vat had a great importance, as it henceforth permitted cold-dyeing, which was not possible with the woad (or woad-indigo) fermentation vat employed in Europe before the use of indigo by itself became general for cotton in the 18th century. This fact simplified greatly both the preparation of resists and the governing of the vat. The Indian indigo fermentation-vat, though not really cold, had a temperature below the melting-point of wax-resist. (The woad had a dyeing capacity inferior to that of indigo, and the vat had thus to be heated ; the copperas vat, being harmful to wool, could not therefore be employed for this animal fibre.

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